



Rocky Flats Environmental Technology Site

RECONNAISSANCE LEVEL CHARACTERIZATION REPORT (RLCR)

883 CLUSTER CLOSURE PROJECT (Buildings 883 and 879)

REVISION 0

October 17, 2001

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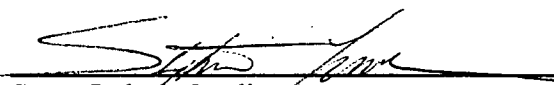
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ABBREVIATIONS/ACRONYMS

ACM	Asbestos containing material
Be	Beryllium
CDPHE	Colorado Department of Public Health and the Environment
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
DCGL _{EMC}	Derived Concentration Guideline Level – elevated measurement comparison
DCGL _W	Derived Concentration Guideline Level – Wilcoxon Rank Sum Test
D&D	Decontamination and Decommissioning
DDCP	Decontamination and Decommissioning Characterization Protocol
DOE	U.S. Department of Energy
DPP	Decommissioning Program Plan
DQA	Data Quality Assessment
DQOs	Data Quality Objectives
EPA	U.S. Environmental Protection Agency
FDPM	Facility Disposition Program Manual
HVAC	Heating, Ventilation, Air Conditioning
HSAR	Historical Site Assessment Report
IHSS	Individual Hazardous Substance Site
IWCP	Integrated Work Control Package
K-H	Kaiser-Hill
LBP	Lead-Based Paint
LLW	Low-Level Waste
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MSC	Manufacturing Sciences Corporation
MDA	Minimum Detectable Activity
MDC	Minimum Detectable Concentration
NORM	Naturally Occurring Radioactive Material
NRA	Non-Rad-Added Verification
ORNL	Oak Ridge National Laboratories
OSHA	Occupational Safety and Health Administration
PARCC	Precision, Accuracy, Representativeness, Comparability and Completeness
PCBs	Polychlorinated Biphenyls
PDS	Pre-demolition Survey
PLM	Polarized Light Microscopy
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RLC	Reconnaissance Level Characterization
RLCR	Reconnaissance Level Characterization Report
RSP	Radiological Safety Practices
SVOAs	Semi-Volatile Organic Analyses
TBD	Technical Basis Document
TCLP	Toxicity Characteristic Leaching Procedure
TSI	Thermal Systems Insulation
TSA	Total Surface Activity
VOAs	Volatile Organic Analyses

EXECUTIVE SUMMARY

A Reconnaissance Level Characterization (RLC) was performed to enable facility "Typing" per the DPP (10/8/98) and compliant disposition and waste management of the 883 Cluster anticipated Type 2 facilities (883 and 879). Because these facilities were anticipated to be Type 2 facilities, the characterization was performed in accordance with the Reconnaissance Level Characterization Plan (MAN-077-DDCP). All facility surfaces were characterized in this RLC, including the interior and exterior surfaces of the facilities (i.e., floors (slabs), walls, ceilings and roofs). Anticipated Type 1 facilities in the 883 Cluster will be characterized at a later date during the closure project. Environmental media beneath and surrounding the facilities were not within the scope of this RLCR and will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA.

The RLC encompassed both radiological and chemical characterization to enable compliant disposition and waste management pursuant to the D&D Characterization Protocol (MAN-077-DDCP). The characterization is built upon physical, chemical, and radiological hazards identified in the facility-specific Historical Site Assessment Report. Specific sample collection locations were also identified during facility walk-downs performed during the RLC. Results indicate that radiological and beryllium contamination exists in excess of the RLCP prescribed release limits. Asbestos containing materials in both friable and non-friable forms are assumed to exist in all building materials suspected of containing asbestos in Building 883. Sampling verified no asbestos containing materials are present in B879. Oil containing PCBs above the regulatory threshold of 50 ppm is located in the pit beneath the "B" Mill in Room 112. Oil containing PCBs was detected *below* the regulatory threshold in the floor of the elevator shaft, room 109 "A" Press pit, and the room 102 "B" Press pit. The concrete surfaces of these areas are therefore expected to be PCB contaminated; they will be characterized for PCBs (in-process) once the oil has been removed. Fluorescent light ballasts may contain PCBs. PCB ballasts and asbestos containing materials will be removed and disposed in compliance with Environmental Protection Agency (EPA) and Colorado Department of Public Health and Environment (CDPHE) regulations prior to facility disposition. Since B883 and B879 were constructed prior to 1980, it is assumed that all painted surfaces of these buildings contain PCBs. Painted demolition debris will either be disposed of as PCB Bulk Product Waste, or, if meeting the release criteria for all other constituents as noted in the Concrete RSOP, the concrete will be used as backfill onsite. All demolition debris will be managed in accordance with Environmental Compliance Guidance #27, *Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal*, as applicable.

Concentrations of methylene chloride and naphthalene were detected in the oil in the room 105 Clearing Press and the room 102 "B" Press. However, as discussed in Section 4.2.3, these chemicals are dismissed as RCRA listed wastes because they do not entirely meet the RCRA requirements to be classified as F002 (in the case of methylene chloride) or U165 (in the case of naphthalene). As in the case of PCBs, the concrete making-up the pits will be characterized (in-process) for these chemicals once the oil has been removed.

The exteriors of 883 and 879 were surveyed in accordance with PDSP requirements and meet the PDSP release limits. Therefore, the exterior PDS surveys of these facilities are considered complete. If any future potentially contaminating event were to take place during D&D activities that could contaminate the exterior surfaces of these facilities, then these surfaces shall be resurveyed prior to demolition. Additionally, a confirmation smear survey shall be performed on the exterior surfaces prior to demolition. To ensure that the facility exteriors remain free of contamination and that PDS data remain valid, isolation controls have been established, and the facilities have been posted accordingly.

Based upon this RLCR and subject to concurrence by the CDPHE, anticipated Type 2 883 Cluster facilities (i.e., 883 and 879) are considered to *be* Type 2 facilities. Tanks 013 and 016 were characterized and were found to resemble Type 1 facilities versus Type 2 facilities. Therefore, these two tanks are considered to *be* Type 1 facilities and a complete RLC will be performed in the future.

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1 INTRODUCTION

A Reconnaissance Level Characterization (RLC) was performed to enable compliant disposition and waste management of the 883 Cluster anticipated Type 2 facilities (B883 and B879). Because these facilities were anticipated to be Type 2 facilities, the characterization was performed in accordance with the Reconnaissance Level Characterization Plan (MAN-077-DDCP). All facility surfaces were characterized in this RLC, including the interior and exterior surfaces of the facilities [floors (slabs), walls, ceilings and roofs]. Anticipated Type 1 facilities in the 883 Cluster will be characterized at a later date during the closure project. Environmental media beneath and surrounding the facilities were not within the scope of this RLC Report (RLCR) and will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA.

As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous facilities will be removed. Among these are the 883 Cluster facilities. The locations of these facilities are shown in Attachment A. These facilities no longer support the RFETS mission and need to be removed to reduce Site infrastructure, risks and/or operating costs.

Before the 883 Cluster facilities can be decommissioned, a Reconnaissance Level Characterization (RLC) must be conducted; this document presents the RLC results. The RLC was conducted pursuant to the Decontamination and Decommissioning Characterization Protocol (MAN-077-DDCP) and the Reconnaissance Level Characterization Plan (RLCP) (MAN-077-DDCP). The RLC was built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report.

1.1 Purpose

The purpose of this report is to communicate and document the results of the RLC effort. RLCs are performed before building decommissioning to define the radiological and chemical conditions of a facility. RLC conditions are compared with the release limits for radiological and non-radiological contaminants. RLC results will enable project personnel to make decommissioning decisions, develop related worker health and safety controls, and estimate waste volumes by waste types.

1.2 Scope

This report presents the radiological and chemical conditions of the anticipated Type 2 facilities in the 883 Cluster. Chemicals of concern for this RLC pertain to RCRA, CERCLA, and PCBs (regulated under TSCA). Consistent with the RLCP, samples were to be collected when free liquids were discovered. Staining (such as on the concrete flooring or in the pits and trenches within B883) suspected of being the result of a hazardous chemical discovered during the RLC would also be sampled.

Tanks 013 and 016 represent a special circumstance. These tanks, located in the southwest corner and outside of the B883 foundation, are the water collection structures for groundwater and runoff flowing through a system of subsurface foundation drains around the building. Tank 013 and Tank 016 are currently classified as "anticipated Type 2 facilities." No documentation could be located indicating that this foundation drain system ever contained (chemical contamination, radiological, and/or beryllium) contamination. Samples were collected during this RLC to support or refute the anticipated Type 2 classification.

Environmental media beneath and surrounding the facilities are not within the scope of this RLCR and will be addressed using the Soil Disturbance Permit process and in compliance with the Rocky Flats Cleanup Agreement (RFCA).

1.3 Data Quality Objectives

The Data Quality Objectives (DQOs) used in designing this RLC were the same DQOs identified in the Reconnaissance Level Characterization Plan (RLCP) (MAN-077-DDCP). Refer to Appendix D, Section 2.0 of MAN-077-DDCP for these DQOs.

2 HISTORICAL SITE ASSESSMENT

Facility-specific Historical Site Assessments (HSAs) were performed to understand facility histories and related hazards. The assessment was the result of facility walkdowns, interviews, and document review, including review of the Historical Release Report (refer to the D&D Characterization Protocol, MAN-077-DDCP). Results were used to identify data gaps and needs, and to develop radiological and chemical characterization packages. Results of the facility-specific HSAs were documented in a facility-specific Historical Site Assessment Report (HSAR). Refer to Attachment B, Historical Site Assessment Report, for a copy of the 883 Cluster HSAR. In summary, the HSAR identify potential radiological and chemical hazards.

3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS

The 883 Cluster was characterized for radiological hazards per the RLCP. Section 3.1 describes the radiological characterization process that was performed, and Section 3.2 summarizes the radiological hazards that were identified.

3.1 Radiological Characterization

Radiological characterization was performed to define the nature and extent of radioactive materials that may be present on or in the facilities. Measurements were performed to evaluate the contaminants of concern. Based on facility histories, personnel interviews, and previously collected isotopic data, radiological surveys were conducted for uranium, plutonium, and related radioactive isotopes. Therefore, alpha and beta (as an added measure) contamination surveys were performed, and the results were compared to the RLCP uranium and plutonium surface contamination guidelines. All removable surface contamination smears were retained for gamma spectroscopy isotopic analysis.

Based on facility histories, building walkdowns, and MARSSIM guidance, the facilities were broken down into survey areas based on existing data (Building Survey Areas A-H) and newly acquired data (Building Survey Areas D & F). A Radiological Characterization Plan (refer to Attachment C) was developed during the planning phases that describe how the facilities were broken-down into survey areas and the minimum measurement requirements per survey area.

Radiological survey area packages were developed for each survey area in accordance with Radiological Safety Practices (RSP) 16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation and Closure*. Total Surface Activity (TSA), removable and scan measurements were collected in accordance with RSP 07.02, *Contamination Monitoring Requirements* (interior RLC surveys), and RSP 16.02, *Radiological Surveys of Surfaces and Structures* (exterior PDS surveys). Radiological survey data were verified, validated and evaluated in accordance with RSP 16.04, *Radiological Survey/Sample Data Analysis*. Quality Control measures were implemented throughout the survey and sampling process in accordance with RSP 16.05, *Radiological Survey/Sample Quality Control*.

Radiological data, analysis results, and survey locations are presented in Attachment E, Radiological Data Summaries and Survey Maps. Radiological survey packages are maintained in the 883 Cluster Characterization Project files. Attachment E-1 contains Tables E-1 through E-4 showing the results of the MSC data and ORNL data.

Most interior facility characterization data of 883 already existed from prior surveys performed by the Manufacturing Sciences Corporation (MSC) during the late 1990s and by the Oak Ridge National Laboratories (ORNL) in 1998. Therefore, only RLC data gaps were specified in the 883 Cluster Characterization Plan. This RLCR summarizes both existing MSC and ORNL data, and newly acquired RLC data. Exterior facility characterization surveys were obtained by the D&D Program Office as part of a site-wide Technical Basis Document development effort and were performed to satisfy PDSP requirements as well as RLCP requirements. The 883 Cluster exterior facility characterization survey results are reported in Attachment E-4 of this RLCR.

It is known, based on sampling results, that the ventilation system within B883 and B879 is contaminated. It is assumed that other facility systems are potentially contaminated. Therefore, facility system piping, ducting, conduit, plenums, equipment, etc. were not considered during the RLC with the exception of the B883 process waste tanks. These tanks were sampled for isotopic gamma spectroscopy analysis.

It is assumed that all painted surfaces in potential MARSSIM Class 1 and Class 2 PDS survey areas will either be stripped or disposed of as LLW or LLMW during in-process D&D work. Therefore, radiological media and volumetric sampling was not performed during the RLC. However, smears were taken from all trenches, sumps, pits, and process waste tank interiors, and were also analyzed to identify isotopic contamination. Gamma spectroscopy analyses results can be found in Attachment E-5.

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MSC data were utilized to satisfy RLC requirements for 883 Survey Areas A-H, greater than two meters; 883 Survey Areas B, D, G, & H, less than two meters; and equipment. Refer to Attachment E-1, Table E-1 for MSC data results greater than two meters (Survey Areas A-H), Attachment E-1, Table E-2 for MSC data results less than two meters (Survey Areas B, D, G, & H), and Attachment E-1, Table E-3 for equipment. Attachment E-1, Tables E-1, E-2, and E-3 were derived by consolidating approximately 4000 pages of individual survey data forms. Refer to the 883 Characterization Project files for specific sample data results and sample map locations of all MSC data.

ORNL data were utilized to satisfy RLC requirements for 883 Survey Areas A-F, less than two meters and equipment. Refer to Attachment E-1, Table E-4 and ORNL survey maps for ORNL data results less than two meters and equipment (Survey Areas A-F).

Attachment E-2 contains the B883 Fixed Contamination Log and semi-annual verification surveys required by the RFETS Radiological Control Manual. Refer to RSP 07.02 Survey form dated 6/15/01 in Attachment E-2 for the latest fixed contamination verification survey results.

Newly acquired data was obtained from all trenches, sumps, pits, and process waste tanks in 883, Survey Area F. Refer to the RSP 07.02 Survey Form dated 8/27/01 in Attachment E-3 for all newly acquired data results from the 883 trenches, sumps, pits, and process tanks (Survey Area F).

Newly acquired data was also obtained in B879. Refer to the RSP 07.02 Survey Forms and map dated 6/28/01 in Attachment E-3 for all newly acquired data results from B879, (Support Building Survey Area D).

Newly acquired data was obtained from the exterior of B883 and B879. In support of the D&D Program Office Technical Basis Document development effort, data was also obtained from the exterior of T883D. Although the results of T883D exterior surveys do not pertain to this RLCR, they are contained in Survey Unit 883006. Refer to the exterior data summary tables and maps for survey units 883001-883009 in Attachment E-4 for all newly acquired exterior data results of B883 and B879.

3.2 Radiological Hazards Summary

The RLC confirmed that the anticipated Type 2 facilities (883 and 879) contain radiological contamination above the surface contamination guidelines provided in the RLCP. The isotopes of concern for B883 are depleted uranium, enriched uranium, and weapons grade plutonium (ventilation system only). All interior survey areas had uranium radiological contamination above the RLCP DCGLs. All removable surface contamination measurements taken from the trenches, sumps, pits, etc., (highest contaminated areas) contained only uranium contamination as verified through gamma spectroscopy.

In 1996, B883 Radiological Engineering developed a Technical Basis Document (TBD-00056) to isotopically characterize the facility. Analysis of over 3,600 MSC swipes substantiated the absence of transuranic contamination. The only exceptions were the B883 ventilation ductwork and the process waste system. The B883 ventilation ductwork indicated loose transuranic alpha contamination due to Pu-239/240 and Am-241. The process waste system was not sampled during the TBD development, therefore it was considered to be transuranically contaminated by default. The process waste system was sampled as a part of this RLC, and gamma spectroscopy did not indicate transuranic contamination. A more thorough ventilation system isotopic characterization should be performed during in-process surveys conducted during ventilation removal. If in-process surveys determine that transuranic contamination still exists within the ductwork, particular care should be taken to ensure the building surfaces are not contaminated with transuranic isotopes. Radiological surveys and isotopic analysis of building surfaces in the vicinity of affected ductwork may be required to verify building surfaces do not contain transuranic contamination prior to Pre-Demolition Surveys. If the B883 ventilation ductwork is removed without any spread of transuranic contamination, the remaining building structure and systems can and should be characterized using uranium PDS guideline values only.

Attachment E-5 contains the gamma spectroscopy results gathered during RLC activities. All removable surface contamination measurements taken from B883 trenches, sumps, pits, and process waste tanks were analyzed using the Canberra ISOCs system. Results did not indicate any transuranic contamination, only uranium contamination.

None of the exterior survey areas had radiological contamination above the RLCP or PDSP DCGLs. Since the exterior radiological surveys of the 883 Cluster anticipated Type 2 facilities were performed to the PDSP criteria, these surveys also satisfy PDS requirements for the exterior surfaces of these facilities. If any future potentially contaminating event were to take place during D&D activities that could contaminate the exterior surfaces of these facilities, these surfaces would be resurveyed prior to demolition. Additionally, a confirmation smear survey shall be performed of the exterior surfaces prior to demolition. The following Table 3.2 summarizes the surfaces where contamination was found above the RLCP surface contamination guidelines from all RLC data sources.

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Table 3.2 Radiological Data Summary

(X = Areas above RLCP Surface Contamination Guidelines, O = Areas below RLCP Surface Contamination Guidelines)

Survey Area	Floors & Lower Walls	Upper Walls & Ceilings	Equipment
B883, Survey Area A	X	X	O
B883, Survey Area B	X	X	X
B883, Survey Area C	X	O	O
B883, Survey Area D	X	X	X
B883, Survey Area E	X	X	O
B883, Survey Area F	X	X	O
B883, Survey Area G	O	O	X
B883, Survey Area H	X	O	X
B883, Survey Area D (Trenches, sumps, pits)	X	O	X
883 Exterior	O	O	O
B879 Interior	O	O	X
B879 Exterior	O	O	O

4 CHEMICAL CHARACTERIZATION AND HAZARDS

The 883 Cluster was characterized for chemical hazards per the RLCP. Section 4.1 describes the chemical characterization process, and Section 4.2 summarizes the (chemical) analytical results. Potential contaminants of concern include asbestos, beryllium, RCRA/CERCLA constituents, and polychlorinated biphenyls (PCBs). Refer to Attachment F, Chemical Summary Data and Sample Maps, for details on sample results and sample locations.

4.1 Chemical Characterization

Chemical characterization was performed to determine the nature and extent of chemical contamination present on or within the anticipated Type 2 facilities within the B883 Cluster. The decision to perform chemical sample collection was determined based upon a review of historical and process knowledge, visual inspections, and RLCP DQOs. Specific sample locations were identified based on historical process knowledge, historical spill events, and/or visual evidence seen during facility RLC walk-downs. The sample strategy is stipulated in a chemical characterization package (refer to Attachment D) was developed during the RLC planning phase which describes sample type, the justification for sample locations, and the estimated number of samples to be collected per sample location and sample type. Based on the HSAR, *no known areas* of hazardous chemical contamination were apparent.

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Visual evidence generally pertained to free liquids, sludge, and/or suspicious staining identified during RLC activities would be sampled and analyzed for RCRA/CERCLA constituents and PCBs. Visual evidence was an important aspect of the sample collection strategy since there are many steel plate covered pits, trenches, and utility chases throughout B883 which were removed for inspection and (Be and radiological) sample collection.

Free liquid was identified at six locations throughout B883:

- 1) The floor of the cargo elevator shaft located in the basement of B883. The sample media was used oil.
- 2) A pit covered with steel plate located in room 109 associated with "A Press" (emptied idle equipment). The sample media was used oil.
- 3) A pit covered with steel plate located in room 102 associated with "B Press" (emptied idle equipment). The sample media was used oil.
- 4) A pit covered with steel plate located in room 105 associated with a "Clearing Press" (emptied idle equipment). The sample media was used oil.
- 5) A pit covered with steel plate located in room 112 associated with "B Mill" (emptied idle equipment). The sample media was aqueous.

As previously noted (Section 1.2, Scope) Tank 013 and Tank 016 are foundation drain sumps located outside the southwest corner of B883. Sediment and aqueous samples were collected from these sumps during the B883 RLC in order to provide data to support or refute their classification as anticipated Type 2 facilities. Chemical analytical results for water and sediment contained in these tanks are also presented in this RLCR.

4.1.1 Asbestos

After reviewing the historical data and conducting the RLC walk-downs and inspections in 883, it was decided the assumption would be made that all building materials that could contain asbestos in 883 contain asbestos. Because a thorough and complete asbestos inspection would be time consuming and costly, no additional asbestos sampling was performed in 883. Asbestos inspections and bulk sampling of suspect ACM were performed in the auxiliary plenum building 879. This auxiliary building had building materials, notably sprayed-on acoustical fireproofing, that could contain asbestos. A CDPHE-certified asbestos inspector conducted the inspection and sampling in accordance with PRO-563-ACPR, *Asbestos Characterization Protocol*, Revision 1. Potential ACM in 879 was identified for sampling at the discretion of the inspector.

4.1.2 Beryllium (Be)

Extensive Be characterization data of the 883 interior already existed from prior surveys performed by Kaiser-Hill Occupational Safety and Industrial Hygiene (OS&IH), the Manufacturing Sciences Corporation (MSC) during the late 1990s, and the Oak Ridge National Laboratories (ORNL) in 1998. Therefore, only RLC data gaps were specified in the 883 Cluster Characterization Package. This RLCR summarizes existing OS&IH, MSC and ORNL Be data, and newly acquired RLC data. For 879 there were not adequate existing data to satisfy RLC requirements. Therefore, random and biased sampling was performed in 879.

4.1.3 RCRA/CERCLA Constituents [including metals and Volatile Organic Analyses (VOAs)]

Per the chemical characterization package, RCRA/CERCLA aqueous samples were analyzed for total VOAs, semi-VOAs, and total metals (including mercury). For media *suspected* of being used oil, "fingerprint" analyses were also performed, which indicate basic physical characteristics such as volatility, flash point, and pH. Since the elevator shaft media was known to be hydraulic oil, chemical analyses only included metals and PCBs. Tank 013 and Tank 016 analyses include VOAs, SVOAs, total metals, and PCBs analyses.

Sampling for lead in paint in the 883 Cluster was not required. Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP) and Lead-based paint Debris Disposal*, states that LBP debris generated outside of currently identified high contamination areas shall be managed as non-hazardous (solid) wastes, and additional analysis for characteristics of hazardous waste derived from LBP is not a requirement for disposal.

4.1.4 Polychlorinated Biphenyls (PCBs)

As indicated by the HSAR, there were no historical documentation or worker (interviewee) recollection pertaining to spill or release events involving PCBs. However, the HSAR indicates that based on the age of B883, PCB paints, PCB-containing equipment, and/or PCB ballasts may be present.

Since B883 and B879 were constructed prior to 1980, it is assumed for this RLCR that all painted surfaces in these buildings contain PCBs. Therefore, painted concrete surfaces were not sampled for PCBs during the RLC. Painted demolition debris will either be disposed of as PCB Bulk Product Waste, or, if meeting the release criteria for all other constituents as noted in the Concrete RSOP, the concrete will be used as backfill on site.

Any idle equipment and hydraulic lines containing hydrocarbon fluids are to be analyzed for PCBs as they are encountered during in-process characterization. Such equipment and lines containing PCBs above regulatory threshold concentrations will be dispositioned as Toxic Substance Control Act (TSCA) waste. PCB ballasts that are present in B883 and B879 will be removed and disposed in accordance with site procedures prior to building demolition.

As with the RCRA/CERCLA constituents, the Chemical Characterization Package stipulates that any free liquids, sludge, and/or suspicious staining identified during RLC activities would be sampled and analyzed for PCBs. Consistent with this, all seven liquid sample locations identified during RLC walk-downs were analyzed for PCBs.

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4.2 Chemical Hazards Summary

The following sections summarize the chemical hazards identified during the RLC.

4.2.1 Asbestos

Building 883 – It is assumed that all building materials that could contain asbestos do, in fact, contain asbestos. These building materials include, but are not limited to, the following: thermal systems insulation (TSI); transite and gypsum wallboard; drywall joint compound; floor tile, linoleum and mastic adhesive; ceiling tiles; spray-on fireproofing; and tar-impregnated roofing.

Building 879 – The east wall (14' high by 92' L) of the air-handling equipment room adjacent to the plenum area is covered (1,288 SF) with a spray-on, acoustical fireproofing. Five (5) random bulk samples were obtained for asbestos analysis. Underneath the gray, spray-on fireproofing is a layer of foam or Styrofoam. The wall substrate is concrete, twin T's. PLM sampling results for these areas were negative for asbestos. Asbestos sample data and sample location maps are contained in Attachment F, Chemical Summary Data and Sample Maps, Table F-1.

4.2.2 Beryllium

Extensive random and biased surface and air sampling for beryllium has been conducted in Building 883 in the past few years. The overall purpose of these surveys was to determine the ambient levels of beryllium in locations known to have processed beryllium. In general, only *accessible* surfaces were addressed. Even so, the sampling data show that many areas in 883 are beryllium contaminated. MSC collected beryllium sample data during the late 1990s (refer to Attachment F, Table F-2, for a summary of MSC data per sample area). In 1998, ORNL collected beryllium sample data (refer to Attachment F, Table F-3 for a summary of ORNL data). Tables F-2 and F-3 were derived by consolidating approximately 4,000 pages of individual survey data forms. Refer to the B883 Characterization Project files for specific sample data results and sample map locations of all MSC and ORNL data.

Additional sampling was performed in the 883 pits, sumps, trenches and fume hoods. These sample locations ranged as high as $21.903 \mu\text{g}/100\text{cm}^2$ (refer to Attachment F, Table F-4, for a summary of newly acquired data in 883 pits, sumps, trenches and fume hoods). There was not adequate existing data in 879 to satisfy RLC requirements; therefore, random and biased sampling was performed in 879 (refer to Attachment F, Table F-4 for a summary of newly acquired data in 879).

Table 4.2 summarizes the rooms and surfaces where beryllium contamination was found above the RLCP beryllium surface contamination guidelines from all RLCR data sources, including existing OS&IH data.

Table 4.2 Location of Beryllium Contamination ($> 0.2 \mu\text{g}/100 \text{ cm}^2$)
(X = Areas above RLCP Surface Contamination Guidelines, O = Areas below RLCP Surface Contamination Guidelines, including rooms not listed)

Location/Room	Floors & Lower Walls	Upper Walls/Surfaces & Ceilings	Equipment
B883, Room 106	O	X	X
B883, 107	O	X	O
B883, 108	X	X	O
B883, 109	O	X	O
B883, 115	X	O	O
B883, 124	X	O	O
B883, 136	X	X	X
B883, 137	O	X	O
B883, 138	X	X	O
B883, 140	O	O	X
B883, 144	O	X	X
B883, 145	X	X	X
B883, 145A	O	X	O
B883, 146	O	X	O
B883, 148	X	X	X
B883, 151	X	X	X
B883, 153	O	O	X
B883, 172	X	X	O
N Walls	O	X	X
879	O	O	X

4.2.3 RCRA/CERCLA Constituents

Based on the HSA of the B883 Cluster, there was no documentation of RCRA/CERCLA constituent operations, storage or spills. However, during RLC walk-downs of B883, free-standing liquid was identified at five locations inside B883. Except for hydraulic oil in the elevator shaft, liquids in the other four locations appeared to be either used oil (hydrocarbon) or aqueous. As previously noted, sediment and aqueous samples were also collected from Tank 013 and Tank 016 foundation drains. Samples were analyzed for VOAs, semi-VOAs, metals, and PCBs. A "fingerprint" analysis was also performed on the used oil samples.

Chemical analysis confirmed that samples were either used oil or aqueous. The used oil most likely originated from the (idle) equipment associated with the pit from which the sample was obtained. RCRA/CERCLA sample data and sample location maps are contained in Attachment F, Chemical Summary Data and Sample Maps.

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Analytical results indicate that RCRA/CERCLA chemicals are not present at concentrations above regulatory threshold concentrations. However, with regard to RCRA wastes, low concentrations (not greater than .87 ppm) of methylene chloride and naphthalene (not greater than 5.1 ppm) were detected in the oil in the room 105 Clearing Press and the room 102 "B" Press. With regard to the methylene chloride, under the "RCRA rebuttable presumption test", if a used oil contains more than 1000 ppm total halogen, it is presumed that spent chlorinated solvent has been mixed into the used oil, unless it can be proven otherwise. This test implies that halogens up to 1000 ppm is acceptable in oil designated for recycle.

The naphthalene is dismissed as a potential "U-listed" RCRA waste since there is no documentation indicating a spill of naphthalene ever occurred in B883 and it is highly unlikely that pure, commercial naphthalene (as stipulated by RCRA) would ever have been discarded in B883. Naphthalene was commonly used to form hydronaphthalenes (e.g., tetralin, decalin), a common constituent in lubricants, solvents, and motor fuels. Chemical analysis commonly reveals these constituents as naphthalene. Also, naphthalene is used in the manufacture of synthetic resins, which may have been used in the facility. The RCRA "U165" code therefore, does not apply.

However, once the oils are removed from these pits, if the pits are concrete floors, in process sampling will be conducted to characterize the areas of these pits.

4.2.4 PCBs

All RCRA/CERCLA environmental samples were analyzed for PCBs, including the sediment samples collected from Tank 013 and Tank 016. Analytical results indicate that PCBs are present above the regulatory threshold of 50 parts per million (ppm) in the sample collected from the room 105 Clearing Press pit. PCBs were detected at 2,000 ppm Aroclor 1248, and 1,200 ppm Aroclor 1016. The used oil in the elevator shaft and the pits beneath "A" Press in room 109 and "B" Press in room 102 also contained PCBs but in concentrations significantly below the 50 ppm threshold. PCB sample data and sample location maps are contained in Attachment F, Chemical Summary Data and Sample Maps. During decommissioning, these oils will be removed and appropriately managed. After the oils have been removed, if the pits have concrete floors, in process sampling will be conducted to characterize the areas of these pits. As indicated in Section 4.1.4, since B883 and B879 were constructed prior to 1980, it is assumed that the painted surfaces contain PCBs. Therefore, painted concrete surfaces were not sampled for PCBs during the RLC.

5 PHYSICAL HAZARDS

Physical hazards associated with the 883 Cluster facilities consist of those that are common to industrial environments and include hazards associated with energized systems, utilities, and trips and falls. "A" Press and "B" Press pits required confined space entry for sample collection, which was supervised by a qualified Industrial Hygienist. No other unique hazards associated with sample collection were encountered. The facilities have been relatively well maintained and are in good physical condition, and therefore, do not present hazards associated with building deterioration. Physical hazards are controlled by the Site Occupational Safety and Industrial Hygiene Program, which is based on OSHA regulations, DOE orders, and standard industry practices. Based on the anticipated D&D complexity of these buildings, a Type 2 designation is warranted.

6 DATA QUALITY ASSESSMENT

Data used in making management decisions for decommissioning of the 883 Cluster, and consequent waste management, are of adequate quality to support the decisions documented in this report. The data presented in this report (Attachments A-G) were verified and validated relative to DOE quality requirements, applicable EPA guidance, and original DQOs of the project.

In summary, the Verification and Validation (V&V) process corroborates that the following elements of the characterization process are adequate:

- ◆ the *number* of samples and surveys;
- ◆ the *types* of samples and surveys;
- ◆ the sampling/survey process as implemented "in the field"; and,
- ◆ the laboratory analytical process, relative to accuracy and precision considerations.

Details of the DQA are provided in Attachment H.

7 DECOMMISSIONING WASTE TYPES AND VOLUME ESTIMATES

The decommissioning, demolition and disposal of the 883 Cluster will generate a variety of wastes. Attachment G presents the estimated waste types and waste volumes by facility. There is radioactive, asbestos, PCB, and beryllium waste. Asbestos and PCB ballasts will be managed pursuant to Site asbestos and PCB abatement and waste management procedures.

8 FACILITY CLASSIFICATION AND CONCLUSIONS

Based on the analysis of radiological, chemical and physical hazards, the anticipated Type 2 883 Cluster facilities (i.e., 883 and 879) are classified as RFCA Type 2 facilities pursuant to the RFETS Decommissioning Program Plan (DPP; K-H, 1999). The Type 2 classification is based on a review of historical and process knowledge, previous data, and newly acquired RLC data, and will be subject to concurrence by the CDPHE.

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The RLC of the 883 Cluster was performed in accordance with the DDCP and RLCP, all RLCP DQOs were met, and all data satisfied the RLCP DQA criteria. The exteriors of these buildings were surveyed in accordance with PDSP requirements and meet the PDSP release limits. Therefore, the exterior PDS surveys of these facilities are considered complete. If any future potentially contaminating event were to take place during D&D activities that could contaminate the exterior surfaces of these facilities, then these surfaces would be resurveyed prior to demolition. Additionally, a confirmation smear survey shall be performed of the exterior surfaces prior to demolition. To ensure that the facility exteriors remain free of contamination and that PDS data remain valid, isolation controls have been established, and the facilities have been posted accordingly.

The demolition of these facilities will generate radioactive, asbestos, PCB and beryllium wastes. PCB ballasts and asbestos containing material will be removed and disposed of in compliance with EPA and CDPHE regulations.

With regard to the used oil contaminated with methylene chloride and naphthalene, since RCRA codes do not apply, and assuming that the oil is free-releasable, it is anticipated that this oil will be eligible for recycle. The concrete surfaces that are in contact with this used oil may also be contaminated and will therefore be characterized (in-process) for hazardous waste once the oil has been removed. Painted concrete surfaces are considered to contain PCBs. Painted demolition debris will either be disposed of as PCB Bulk Product Waste, or, if meeting the release criteria for all other constituents as noted in the Concrete RSOP, the concrete will be used as backfill onsite. Environmental media beneath and surrounding the facilities will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA. Assuming that the used oil containing PCBs is free-releasable, it is anticipated that it will be dispositioned as either PCB waste or treated (in the case where the PCB concentration is less than 50 ppm). The concrete surfaces of all pits where PCBs was detected is expected to be PCB contaminated; they will be characterized for PCBs (in-process) once the oil has been removed.

Tank 013 and Tank 016 are currently classified as "anticipated Type 2 facilities". However, no documentation could be located indicating that this foundation drain system ever contained (chemical contamination, radiological, and/or beryllium) contamination. Sample analyses indicate that the water currently in these tanks do not contain any contamination above (RCRA, CERCLA, and/or PCB) regulatory thresholds. Also, sediment (including any contamination it contains) will tend to persist over time. Since no chemical contamination is present in the sediment of these tanks, it is unlikely that these tanks ever contained contaminants. This cumulative evidence supports the recommendation that these tanks be reclassified from Type 2 to Type 1 structures.

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Attachment G – Decommissioning Waste Types and Volumes Estimates

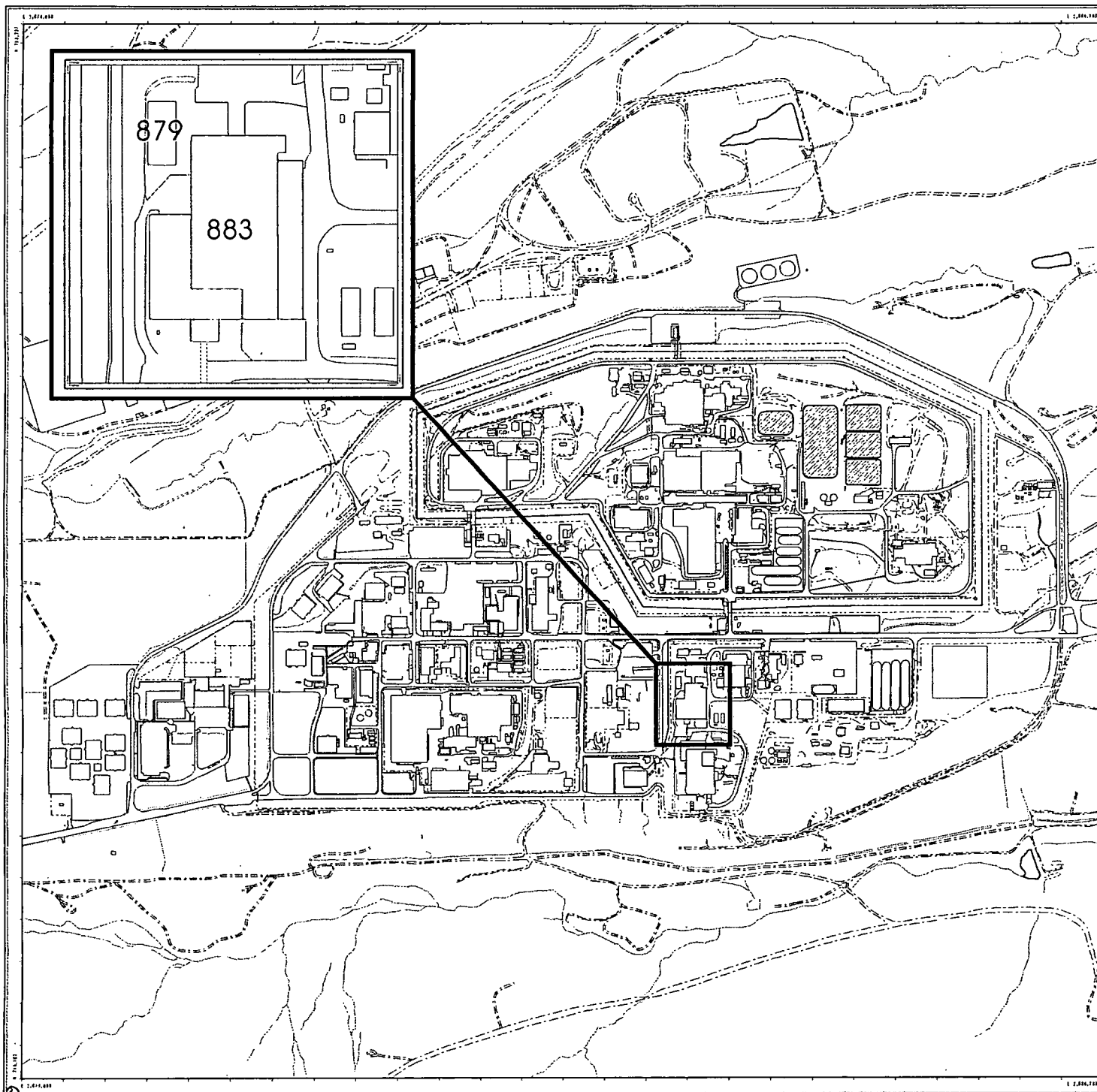
Facility	Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated/ Sheet Metal (cu ft)	Wall Board (cu ft)	ACM (cu ft)	Other Waste (cu ft)
883	102,269	0	11,650	0	3,345	Friable – 7,452 Non-Friable – 19,845	Urethane 19,224 cu ft
879	3,000	0	2,300	950	0	0	Roofing buildup 400 cu ft Insulation 1,300 cu ft

- (1) Volume will be re-estimated after the facility is inspected and related analytical data are assessed.
- (2) Friable building materials include, but are not limited to, thermal systems insulation, surfacing materials (such as spray-on fireproofing), drop ceiling tiles, and sheet vinyl linoleum. Non-friable building materials include, but are not limited to, floor tile, mastic adhesives, corrugated transite wall board, and tar-impregnated roofing.
- (3) Used Oil Waste Estimates are as follows:
>50 ppm PCB Used Oil will be dispositioned as a PCB waste: Room 105 Clearing Press; 200 gallons
<50 ppm PCB Used Oil will ultimately be dispositioned as a Used Oil: Room 109 "A" Press; 200 gallons;
Room 102 "B" Press; 200 gallons; Elevator Shaft; 10 gallons

Note: All waste types are assumed to be LLW and Be waste, unless decontaminated during in-process activities.

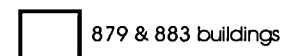
ATTACHMENT A

Facility Location Map

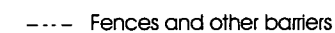
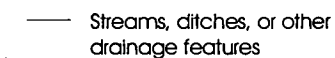
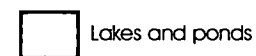
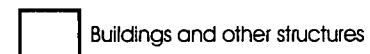


Buildings 879 & 883

EXPLANATION

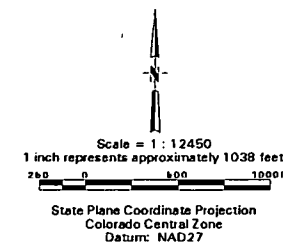


Standard Map Features



DATA SOURCE BASE FEATURES:

Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotographs, 1/95



U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-965-7707

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MAP ID: FY 2002

October 16, 2001

NT_Sw w/project/2002/02-003/7883.cdr

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ATTACHMENT B

Historical Site Assessment Report

BUILDING 883 CLUSTER

HISTORICAL SITE ASSESSMENT (HSA)

JULY 2001

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1.0 INTROCUCTION

This Historical Site Assessment (HSA) is intended to provide a summary of the historical operations, building descriptions, as well as an overview of facility contamination history. Much of the Building 883 process history and the physical descriptions were obtained from the Building 883 Historical Release Report (EG&G, 1994), the Draft Safety Analysis Report (EG&G, 1982), and the Facility Safety Analysis (RMRS, 1998). Other sources of information were the Building WISRIC, Site Master List of RCRA Units, and the Site IHSS, PAC, and UBC databases and personnel interviews.

The individual Subject Mater Experts (SME) should evaluate/verify this information during the RLC/PDS process. The SMEs may need to review additional documents and perform additional interviews.

This HSA was performed prior to SME walkdowns, and chemical and radiological characterization package preparations. Information contained in this HSA only represents a "snapshot" in time. Subsequent data may be obtained during SME walkdowns and chemical and radiological characterization package preparations, which may conflict with this report. However, this report will not be amended, and the newer data will take precedence over the data in the report. Newer Data will appear in the RLCR/PDSR

Building 883, also known as the Uranium Rolling and Forming Facility, is a two-story, steel-framed building with a partial basement. Building 883 in an anticipated Type 2 facility and was constructed in 1957 as part of a major plant expansion to machine enriched and depleted uranium parts. Enriched uranium operations in Building 883 were discontinued between 1964-1966 when all enriched uranium work was moved to Oak Ridge National Laboratory.

Building 883 continued to work on special projects such as the manufacturing of armor plating for the M1A1 tanks, until the late 1980's. Building 883 also machined other non-fissile metals such as beryllium, tungsten, stainless steel, aluminum and vanadium, which were a part of plutonium weapons production.

Process operations conducted in Building 883 included cleaning, heating, shaping, rolling, cutting, and forming. The sealed hollow shape of the components in the new weapon design required a significant amount of rolling and forming of both enriched and depleted uranium.

Building 883 has three levels; the basement, the first floor and the second floor, which is some times called the first floor mezzanine.

The basement area includes utility rooms (Rooms 6 and 7), a process waste collection area (Room 1), and a maintenance area (Room 3). Room 5 is the entrance to an underground tunnel, which leads to Building 881 and the air ventilation tunnels. The majority of the basement has had the furnishings, tools, and supplies removed.

The first floor consists of office space on the south side of the building and the process areas. The original exhaust air plenums and an electrical control room are also on the first floor. The processing areas in the first floor are referred to as "A-Side, "B-Side, "C-Side," and "Annex."

- The Annex section, which lies east of Column Line F, has equipment to support pressing and general maintenance operations. Room 104 contains a drum accumulation area for 30 to 55-gallon drums containing waste oils, solvents, uranium, beryllium and 1,1,1 trichloroethane.
- The A-Side, which lies between Column Lines D and F houses large machines for rolling, pressing, and shearing.
- The B-Side includes rolling, pressing, and shearing operations between Columns A and C.
- The C-Side, which is located west of column line A, supported the manufacturing of depleted uranium armor plating for the M1A1 tanks. Later it was used for waste crate staging of shipments of low-level waste from the facility. Most of the C-Side equipment has been removed.

The second floor areas include the inlet air plenum and associated blowers, heat exchangers, and coolers on the north (Rooms 201, 202, 203, and 207) and offices on the south. These areas are not contaminated. The utility rooms have had all non-essential materials, equipment, and supplies removed as a hazard reduction activity. Similarly, the office areas have had all furnishings removed from them.

The supporting buildings to be included in the Building 883 Cluster are:

883C - Cooling Tower- This is an anticipated Type 1 facility.

879 - Filter Plenum- This is an anticipated Type 2 facility

The supporting exterior tanks associated with the Building 883 Cluster are:

Tank 011 - Diesel tank (north of Building 883) - This is an anticipated Type 1 facility.

Tank 013 - Concrete Foundation Drain Tank north of 881- This is an anticipated Type 2 facility.

Tank 016 - Foundation Sump Tank, Groundwater (southwest corner of Building 883)
This is an anticipated Type 2 facility.

The Building 883 support facilities and support tanks will be discussed below.

2.0 PHYSICAL DESCRIPTION OF BUILDING 883

2.1 General Construction and Foundation

Building 883 is constructed of a steel frame with corrugated asbestos cement exterior panels and some concrete block exterior walls. The construction details of Building 883 and the associated support structures are discussed in later sections.

Since its construction in 1957, four additions have been made to Building 883:

- The 1958 Storage Building addition created additional space for storage and manufacturing. This addition was on the east side of the original structure and is called the annex.
- The 1968 Plenum Room addition provided space for an air supply plenum room, and increased the size of the low bay annex for additional storage and increased the size of the high bay area for an additional manufacturing area. This addition was built on the southeast side of the building.
- The 1972 Valve House addition was built on the north east corner of Building 883. This addition was built to house the main steam valves, which control the plant-supplied steam to Building 883.
- The 1985 C-side addition was built to support manufacturing of armor plates containing depleted uranium for the M1A1 tanks. Machining of non-fissile metals continued until 1989.

The foundation of Building 883 consists of individual spread footings, concrete grade beams and concrete wall footings. The individual spread footings vary in size from 6-foot-square to 12-foot-square and vary in thickness from 2-feet to 3-feet-thick. The concrete grade beams around the periphery of the main building are approximately 10-inches-thick and 6-feet-deep. The concrete wall footings, are approximately 5 to 6 feet-wide and 1½-feet-thick.

The basement concrete floor slab is 8-inches-thick reinforced concrete. The first floor slab on grade is 6-inches-thick reinforced concrete built on grade.

2.2 Walls

The exterior walls are corrugated cement-asbestos for the original building and the high bay area of the 1968 addition. There is rigid insulation 1½-inches-thick between the exterior and interior walls. The exterior walls of the 1958 addition and the low bay section of the 1968 addition are 8-inch-thick concrete block. The exterior walls of the 1972 and 1985 additions are corrugated galvanized steel.

Most of the perimeter interior walls are painted cement asbestos panels. Some areas of the building have painted concrete block. The walls in the manufacturing area are concrete block, while office and hall partitions are cement-asbestos panels on metal studding.

Exterior cement asbestos panel walls are not treated. The exterior cement block walls are painted.

2.3 Floors

Floors in the manufacturing areas are covered with asphalt tile or are sealed with epoxy, while floors in office areas and halls have asphalt tile. The walls and floors in the restrooms are tiled and in the locker rooms they are painted. The floors in the Education offices are tiled or carpeted.

2.4 Ceilings

The ceilings in the office areas are suspended acoustical tiles with integrated lights. The process area ceilings are the exposed undersides of the roof.

2.5 Roof

The roofs for the original building, the 1958 addition, and the 1968 addition consist of metal decking on structural steel framing and 1½-inch-thick rigid insulation.

The 1972 and the 1985 addition has corrugated galvanized steel roofing on structural steel framing. This section had no insulation in the roof.

2.6 Doors

Many of the doors in the building are either solid steel, steel with louvers, or steel with safety glass. There are no airlock doors. Building 883 has five large roll-type equipment doors; two are on the west side, one is on the south side, and two are on the east side.

2.7 Air Tunnels

There are two air tunnels in the basement, which is part of the ventilation system. The tunnels are reinforced concrete with minimum inside dimensions of 6½-feet-wide by 6½-feet-high. The walls of the tunnel are 10-inches-thick, and the floor and roof slabs are 8-inches-thick.

2.8 Exhaust Stacks

There were two steel exhaust stacks immediately north of Building 883, each stack is 8-feet in diameter and 65-feet-high. Reinforced concrete octagon-shaped pedestals supported the stacks. These stacks were removed after the 879 Plenum building was constructed.

3.0 Process Systems And Utilities

3.1 Argon

Argon was used to create inert atmospheres in the furnaces. The argon was supplied to Building 883 from a large tank located outside the northeast corner of the building. It was piped to stations throughout the building. The argon tanks were aboveground tanks and have been removed.

3.2 Breathing Air

Building 883 had a breathing air system that supplied breathing-quality air for supplied-air work. This system is currently deactivated. The system used a portable breathing air compressor to provide breathing-quality air to the building when needed. The portable compressor was connected to the breathing air system at an exterior location north of the building.

3.3 Cooling Water Supply

Process cooling water is provided by cooling tower CT-4, also known as 883C, which is located on the north exterior of Building 881 and south of Building 883. CT-4 also serves Building 881. The Building 883 system is a closed loop system with cool water provided by a 6-inch supplies line from the CT-4 cooling tower. Evaporative cooling is provided by an open-loop spray-water system, which cools the closed-loop cooling coils.

3.4 Compressed Air

Compressed air, regulated to 80 pounds-per-square-inch, was piped throughout the facility and was provided by a 350-cubic-foot-per-minute compressor in Room 6 and a backup compressor in Room 7. The Building 883 compressed air system is currently deactivated.

3.5 Fire Suppression System

The fire suppression system includes automatic sprinkler systems throughout the building, which are supplied by the domestic water system. There are also heat detectors, fire extinguishers, and manual pull boxes.

3.6 Natural Gas

Natural gas from the site supply system entered Building 883 on the south wall at Column C-3 and was only used for the HVAC on the roof.

3.7 Nitric Acid

Nitric acid was supplied from a portable 1,400-liter tank located on a concrete pad west of Building 883. The nitric acid was pumped into the building to a leaching and cleaning bath that was used to remove the oxide from rolled parts.

The nitric acid bath was equipped with a caustic scrubber. Whenever caustic (potassium hydroxide) was sometimes needed, it was mixed in a tank in the Room 110 mezzanine and piped to the scrubber through transfer lines.

3.8 Nitrogen

Nitrogen was used in Building 883 to charge sealed accumulators on the rolling operations. The nitrogen was delivered to the building in cylinders. The nitrogen system has been deactivated.

3.9 Process Waste System

The process waste system in Building 883 has undergone a partial closure. The closure process was successful in removing the majority of the tanks and ancillary equipment. Two tanks remain in the building. They are located in the basement of Room 139. These tanks are Resource Conservation and Recovery Act (RCRA) stable, meaning that they contain no liquid, they have less than one-percent holdup, and that the tanks are locked and tagged out. Process wastes were formerly pumped to Building 374 via a 3-inch stainless steel line, which exits the building at Column 8-A.

3.10 Salt Water

Some milling procedures required a salt-water wash for the parts. There was a salt water system in Building 883 that has two tanks on the mezzanine of Room 110, as well as, filtering equipment, and re-circulating pumps. The salt water was continually filtered and re-circulated during milling operations.

3.11 Sanitary Sewer

Building 883 is connected to the site sanitary sewer by a 6-inch underground line that enters the building via Room 6.

3.12 Steam System

Steam from Building 443 is provided by 2-inch underground lines, which enter Building 883 via Room 100. The steam is currently used for heating. Distribution within Building 883 is described in more detail in Section 6.0.

3.13 Storm Drains

Surface storm drains around Building 883, route water away from the building. According to the P2 storm water plan, Building footing drains route water to the out-fall on the hillside south of Building 881.

3.14 Vacuum Systems

A building vacuum system was located throughout the building. It was utilized to manually cleanup small areas. One system serves the B and C-sides and the second system serves the A-side and annex. Material was collected in a bag system located in the basement. This system is out of service.

There is a health physics vacuum system, located in Room 1, in the basement that is used to provide building-wide air sampling. The sample filters are collected and analyzed on a weekly frequency for radioactive particulate.

3.15 Water

Treated water is supplied to Building 883 by the Water Treatment Plant (B124) through a 10-inch supply main that lies between Buildings 883 and 881, the following smaller lines supply the building.

- A 6-inch line entering the south side supplies water for domestic and process uses.
- A 6-inch line entering the south side provides water for fire protection systems.
- An 8-inch cross-loop line runs north just west of Building 883 to a fire hydrant; from there, a 6-inch line enters the north side of the building, supplying water to fire protection systems on the north side of the building.

4.0 ELECTRICAL

There are two 13.8-kilovolt (kV) transformers on the north side of the building with lines that enter Room 107, one 13.8-kV transformer on the west with lines that enter Room 112 and one 13.8-kV transformer on the south with lines that enter Room 130B.

Room 107 is the primary distribution point for power throughout the building. 480-volt power is distributed throughout the building to power panels, motor control centers, and emergency motor control centers. Standby power is provided from the diesel generator in Building 827. Some equipment in Building 883 required a direct current power source. Room 111 was the central point for conversion of alternating current to direct current power using a 500-hp generator. The 2,400-volt (V) direct current was supplied to the induction furnace, rolling mill and presses on the A-Side and B-side. The direct current power supply system is currently out of service.

Past upgrades removed all polychlorinated biphenyl (PCB) cooled electrical equipment or PCB-contaminated electrical equipment.

5.0 HEATING, VENTILATION AND AIR CONDITIONING (HVAC)

The Building 883 HVAC serves human comfort and negative pressure functions. The primary system that serves the A-side and the B-side is a once-through system with the inlet air

plenums on the second floor in Rooms 202 and 203. The air is exhausted through the Building 879 plenum and then vertically through the two exhaust stacks located on the Building 879 roof. Appropriate negative pressure is maintained by controlling the dampers. Air that enters the inlet plenum is heated by steam or cooled by chillers. The inlet plenums have filters to remove airborne particulate from the outside air. Additional air is drawn through enclosed confinement boxes near the tool heads in some areas. Although these air ducts remain operational, there are no process vapors or particulate being produced due to the lack of operations in the facility.

The air supply system which was installed as part of the 1972 plenum room addition furnishes additional air to the room 130 and part of room 105.

The C-Side has a dedicated HVAC system, which uses a HEPA filter to ensure that exhausted air is appropriately conditioned prior to exhaust. The C-Side has had several modifications to the air movement system and no longer is a CA. This ventilation system is motivated by a 250-horsepower (hp) fan located in Room 301. The office areas have a conventional HVAC system that uses plant steam for heating and cooling tower water for cooling, and is located in Room 220.

6.0 BUILDING 883 OPERATIONAL HISTORY

6.1 ENRICHED AND DEPLETED URANIUM MACHINING

Building 883 began operation as an enriched and depleted uranium rolling and forming facility in 1957 and discontinued uranium operation in 1966. The building was designed with two functional areas or sides to prevent cross contamination of the radioactive enriched uranium with the non-fissile depleted uranium. Side "A" handled depleted uranium while side "B" handled enriched uranium. Depleted uranium was cast in Building 444 and sent to Side A to be heated and rolled into sheets from which blanks of the required shape were pressed and cut. The shaped pieces were then sent back to Building 444 for final turning, trimming and polishing. Side A also periodically handled other non-radioactive metals such as beryllium, tungsten, stainless steel, aluminum and vanadium which also went into plutonium weapon production. Beryllium operations are discussed in Section 7.2. Enriched uranium parts came to Side B from the casting operations in Building 881 and were sent back for final processing.

Metal ingots received from either Building 881 or Building 444 would be placed into a furnace or eutectic salt bath to make the metal suitably malleable for rolling. The ingots were then rolled into sheets and annealed in a second salt bath. The rolled sheets were then cleaned in a bath of trichloroethylene (TCE) or PCE. A roller leveler was used to flatten the cleaned sheets, which would then be cut into circular shapes. The near final shaped "hats" would then be formed using a Marform pressing process that employs a cylindrical press of solid rubber that under pressure behaves like a fluid. The parts were generally cleaned again in a PCE bath and in some instances in a vapor degreaser. The presses were periodically cleaned with PCE, which would be drummed for disposal.

A house vacuum system operated on the B (enriched uranium) side to collect enriched uranium fines, which were sent to Building 881 for recovery. The vacuum system was designed with a cloth filter bag, which would capture the fines. In addition, the molten salt baths would be pumped out annually to recover metal fines that had accumulated in the bottom. Other waste streams from enriched uranium work would be sent to Room 296 of Building 881.

Side B of Building 883 was also used, for a short time, for secondary decontamination of enriched uranium parts that had been contaminated from contact from plutonium parts. The first step in the cleanup occurred in Building 777 with the parts being cleaned to "no smearable levels." However, significant levels of contamination remained even after the Building 777 clean up so that further decontamination was conducted. This was performed originally in Building 883 where after decontamination the parts were broken up in a press in preparation for further salvage. The secondary cleanup step was soon moved to Room 226 in Building 881.

Enriched uranium work was curtailed in Building 881 and Building 883 beginning in 1964 and work was moved to Oak Ridge. In January 1965 all enriched uranium operations were transferred to Oak Ridge and therefore there was no longer a need for enriched uranium rolling and forming in Side B. Side B remained idle for a period of about 17 years after enriched uranium operations were removed.

6.2 BERYLLIUM MACHINING

Beryllium-forming operations, starting in about 1962 and some operations continued until 1986. Nine-inch by nine-inch beryllium ingots, were heated, rolled into sheets less than one-quarter inch thick, cut out of the stainless steel forms, heat-treated in either the acid and/or eutectic salt baths and then pressed into the desired shape in Building 883. The beryllium shapes were then returned to Building 444 for further machining. Another beryllium part was made using a "deep drawn" process in which the beryllium was rolled without the use of a stainless steel outer shell and then deep drawn. This process occurred until the mid-1970s.

During this time period, the southwest corner of Building 883 housed a beryllium grinding room that included an etching bath that held 62 gallons of nitric acid to one pint of hydrochloric acid. Beryllium machining discontinued at the building sometime in the mid-1980s and the building has undergone extensive decontamination since beryllium forming ceased.

6.3 SPECIAL PROJECTS

A series of special order projects took place in Building 883 throughout the late 1970s and the first half of the 1980s. Starting in 1977, thousands of calorimeter plates were manufactured and rolled in Side A using depleted uranium. Other projects included infrequent rolling and forming of cadmium. Construction began in 1983 on Side C to house the manufacture of armor plates for the MIAI tank. Depleted uranium was

incorporated into the armor plates as a mesh. The manufacturing process was piloted in 1983 in Side B. Side B had previously housed the enriched uranium operations and had remained idle since those operations had moved out in about 1966. Full-scale operations began in both Sides B and C in 1985 with hundreds of tons of depleted uranium being processed over the life of the project.

6.4 ROLLING PROCESS

Rolling occurred in Rooms 105, 112 and 138. Metal ingots consisting of stainless steel, aluminum, tantalum, titanium and depleted uranium are heated in a furnace, or in the case of the uranium, in a eutectic salt bath. After softening, the ingots are rolled in one of three rolling machines, which were lubricated with non-hazardous, water-soluble rolling oil.

6.5 SHEARING

Stainless steel, titanium, depleted uranium, and aluminum sheet metal were mechanically cut with equipment into smaller pieces before being shaped. The guillotine action of the equipment used tended not to produce fine particulate or other waste material. This process was discontinued in 1993.

6.6 BLANKING AND TREPPANNING

After rolling, the metal sheets are blanked or trepanned in Rooms 105 and 109. Blanking consists of punch pressing a circular shape using a hydraulic press and blanking die, whereas trepanning consists of cutting a shape using a lathe. The only chemical used in the process is cutting oil (Trim Sol coolant) that is passed over the lathe through a re-circulating system. Wastes produced are metal scraps, including uranium turnings and chips, which are sent to the chip roaster in Building 447.

6.7 PREHEATING AND FORMING

The forming process was located in Rooms 102, 104, 105 and 109 and involves pressing metal blanks into specific shapes following the rolling process. Sometimes the process involved heating the metal with either a torch or in a hot oil bath. Scrap uranium was sent to Building 444 for reprocessing and vanadium was drummed and sent to an off-site recycle. Other metal scrap was drummed in low-level waste drums and sent to Building 664. Chemicals used in the process are non-toxic cleaning fluids (Mariko and De-Solve-It), oil and machining fluids. Along with the scrap metal, the only wastes produced were hot dye lubricant and wax which were vaporized into the exhaust system, cleaning fluids which were collected in low-level waste drums and used oil which was also drummed.

6.8 HEAT TREATING

Heat treating occurred in Rooms 102, 104 and 105, and used high temperatures to anneal metal parts. Solid metal parts consisting of depleted uranium, uranium alloy, stainless

steel, aluminum or tantalum were placed into one of six enclosed and liquid cooled furnaces or into one of four salt baths. The salt bath contains sodium, lithium and potassium carbonates. After heating or bathing, the parts were cooled by water, air or press quenches housed in portable tanks. An oil bath consisting of Dow Corning 550 fluid was occasionally used to cool parts. Wastes produced include argon gas, which was processed in the vent system, and uranium oxide dust and sludge, which were drummed and stored in Building 883.

6.9 CLEANING

Cleaning took place in Rooms 102, 105, 108, 109, 138 and 139, subsequent to the various forming operations. Cleaning solutions used weak nitric acid, De-Solv-It, Mariko, Oakite and Ox-Out, although nitric acid was discontinued sometime between 1991 and 1994. Cleaning rags and other wet combustible waste was placed in low level waste drums while spent Ox-Out solution was drummed and sent to Building 374 for analysis.

Nitric acid cleaning was performed inside an enclosure to control fumes. The process occurred in a double-walled, stainless steel tank located in Room 138. According to the 1991 Air Pollution Emission Notice (APEN), nitric acid was used at a rate of 50 pounds per year. Parts were cleaned by dipping in nitric acid followed by dipping or spraying with water. Ox-Out contains 20 percent nitric acid and cleaning with this product occurred in Room 105 by dipping the parts in a 55-gallon drum of the solution followed by dipping in water,

6.10 GRIT BLASTING

Grit blasting consisted of cleaning a part inside of a closed container using a stream of high velocity air mixed with an aluminum oxide blasting grit. The particulate generated was collected in a cyclone separator and was subsequently filtered through disposable cloth filters. Grit blasting was performed in room 109. This process was discontinued in 1993.

6.11 STEP-OFF PAD, GENERAL MAINTENANCE AND UTILITIES

The step-off pad is located in Room 101 and produces wastes such as used protective clothing and smear paper associated with radiation monitoring. The maintenance and utility functions use chemicals and generate chemical waste such as lubricating oil, bearing grease, ethylene glycol, HTH (algae inhibitor), Nalco (corrosion inhibitor), paints, adhesives, lead-acid batteries, spent florescent light bulbs, ballasts with PCBs and asbestos insulation.

6.12 EXPERIMENTAL RADIOACTIVE DECONTAMINATION

A research decontamination booth was constructed in Side B in the early 1990s and was used to evaluate the effectiveness of a vendor-owned carbon dioxide pellet blaster for removing radioactive contamination.

7.0 POTENTIAL CONTAMINATION AND HAZARDS

Most of the processing areas of the building are contaminated with depleted uranium and are designated as CAs. In addition, significant decontamination has taken place on the C-Side, allowing this area to be downgraded to a Radioactive Material Area (RMA) from a CA. The only area with a potential for transuranic contamination is the HPM press exhaust ventilation ducting (section 3.4, "Final Hazard Classification". Facility Safety Analysis - Building 883 Closure Project, May 1999).

Trace quantities of beryllium in the form of dust generated from previous operations is present in Building 883. All chemicals, with the exception of a minimal number of janitorial supplies have been removed from the building.

Additional information about releases, in and around Building 883 are explained in section 15, "Industrial Hazardous Substance Sites (IHSS), Potential Areas of Contamination (PAC) and Under Building Contamination (UBC)".

7.1 Asbestos

Building 883 is known to contain some asbestos containing material (ACM). Common ACM material is exterior siding, floor tiles, ceiling tiles, thermal insulation, and other building materials.

7.2 Beryllium

Building 883 has several rooms on the RFETS "Location of Known Beryllium Areas" list. These rooms are listed below. Building 883 and Building 879 are the only buildings in the Building 883 cluster with location identified on the list of known beryllium locations. This list is not intended to be a comprehensive list of current Be contamination areas, but instead intended to provide a indication of the extent of Be contamination in the Building 883 Cluster. Be sampling will be performed, as needed, throughout the D&D processes to determine the presence or absence of Be.

BUILDING	ROOM	ACTIVITY
883	1	Collection of Be fines (house vacuum system) and liquid waste
883	101	Step-off Pad
883	102	Forming beryllium
883	102 B*	Unknown
883	104	Receiving and weighting beryllium
883	104 A*	Small scale machining of beryllium
883	105	Rolling and forming beryllium
883	105 A*	Unknown
883	106	Storage of beryllium material
883	108	Storage of beryllium material

883	109	Crushing and forming beryllium
883	109 A*	Unknown
883	110	Liquid waste collection and tool crib
883	112	Rolling beryllium
883	112B*	Unknown
883	117	Step-off Pad
883	130	Tool crib
883	130 A	Storage of beryllium material
883	130B	Storage of beryllium material
883	137	Maintenance
883	138A	Storage of beryllium material
883	139	Plenum, exhausts beryllium operations
883	162 B*	Unknown
883	Air tunnel – A Mill	Exhausts rolling mill
883	Air tunnel – B Mill	Exhausts rolling mill
883	Tunnel to 881	Storage of beryllium material
879	N/A	Plenum for building 883, exhausts beryllium operations

* Room not on current maps

7.3 RCRA REGULATED UNITS.

Building 883 has several areas on the RFETS "Master List of RCRA Units" list. These areas are listed below. Building 883 is the only buildings in the Building 883 cluster with location identified on the Master list of RCRA Units.

Unit #	Building	Unit Description	Regulatory Status	Closure Status
40.27	883	Acid Etch Process Waste Tank T-1	INTERIM STATUS	RCRA STABLE per 99-DOE-03494 (1/28/99) To be closed in accordance with "Closure Plan fir Interim status Units At RFETS"
40.28	883	Acid Etch Process Waste Tank T-2	INTERIM STATUS	RCRA STABLE per 99-DOE-03494 (1/28/99) To be closed in accordance with "Closure Plan fir Interim status Units At RFETS"
40.29	883	Foundry Process Waste Tank T-17	No Longer Subject To RCRA Regulation	CLOSED in Accordance with "Closure Plan, Building 883 A&B Series Waste tank Systems" (ref. 98-DOE-03363)
40.30	883	Foundry Process Waste Tank T-18	No Longer Subject To RCRA Regulation	CLOSED in Accordance with "Closure Plan, Building 883 A&B Series Waste tank Systems" (ref. 98-DOE-03363)
40.31	883	Foundry	No Longer	CLOSED in Accordance with

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		Process Waste Tank T-19	Subject To RCRA Regulation	"Closure Plan, Building 883 A&B Series Waste tank Systems" (ref. 98-DOE-03363)
40.38	883	Foundry Process Waste Tank B-16	No Longer Subject To RCRA Regulation	CLOSED in Accordance with "Closure Plan, Building 883 A&B Series Waste tank Systems" (ref. 98-DOE-03363)
40.39	883	Foundry Process Waste Tank A-24	No Longer Subject To RCRA Regulation	CLOSED in Accordance with "Closure Plan, Building 883 A&B Series Waste tank Systems" (ref. 98-DOE-03363)
40.40	883	Foundry Process Waste Tank A-25	No Longer Subject To RCRA Regulation	CLOSED in Accordance with "Closure Plan, Building 883 A&B Series Waste tank Systems" (ref. 98-DOE-03363)
40.41	883	Foundry Process Waste Tank A-26	No Longer Subject To RCRA Regulation	CLOSED in Accordance with "Closure Plan, Building 883 A&B Series Waste Tank Systems" (ref. 98-DOE-03363)

7.4 IDLE EQUIPMENT

None of the facilities in the 883 Cluster have equipment on the Idle Equipment Management Plan's list of RCRA Hazardous Equipment. The site-wide Idle Equipment Management Plan no longer tracks RCRA non-hazardous equipment. An outdated list of RCRA non-hazardous equipment can be obtained from the RFETS Environmental Systems and Stewardship Group.

8.0 BUILDING 883C COOLING TOWER

The Building 883C cooling tower, also known as CT-4, supplies cooling water to both Building 881 and Building 883. CT-4 is located north of Building 881 and south of Building 883 was constructed in the mid 1980s. The tower is constructed of a metal framing with sheet-metal walls and plastic distribution trays inside the Tower to disperse the cooling water. CT-4 is in mounted on nine concrete pillars and measures approximately 15-feet-wide by 15-foot-long and 9-feet- high. The north side of the structure has metal stairs leading to a metal control panel.

The cooling tower is the final heat sink for the building's closed loop cooling system. The tower obtains it spray-water from the plant domestic water system. Blow-down water is discharged to a french drain east of CT-4. The spray-water is circulated by electric pumps and is sprayed over the internal distribution trays to provide evaporative cooling.

The CT-4 cooling tower is controlled and maintained by Building 881 personnel, and is still active. CT-4 has no postings. Some of the chemical which were used as algacide and corrosive Inhibitors were:

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- 1) HTH (R) All Purpose Algaecide: Ammonium, Alkyl (C12-C16) Dimethylbenzyl-, Chlorides.
- 2) Nalco 2536 Corrosion Inhibitor: Sodium Nitrite and Sodium Tetraborate (anhydrous).
- 3) HTH (R) "Mustard" Algaecide: Alkyldimethyl Dichloro Benzyl Ammonium Chloride and Copper Triethanolamine Complex.

9.0 BUILDING 879 FILTER PLENUM

Building 879 was constructed in 1975 and is a metal frame building with corrugated sheet-metal siding. The fan room has a metal roof and the plenum room has a composite roof. The building is constructed on a 12-inch slab poured on grade. This building houses a two-stage HEPA filter system, control panels, and two fans used to exhaust the air from Building 883. The building is connected to the north and west sides of Building 883 via 2 large metal rectangular ducts.

The system is a once through system with inlet air vents on the north side of the second level of building 883, in rooms 202 and 203. The air then passes through the Building 879 plenum and is exhausted through the two 4-foot by 6-foot stacks located on the roof.

Building 879 is currently active and provides the main ventilation for the A-side, B-side, Annex and the basement of Building 883. Building 883 has radiological and asbestos posting and was not entered during the facility walkdown.

10.0 BUILDING 883 CLUSTER EXTERIOR TANKS

883 cluster has 6 tanks identified on the facility list. These tanks are:

- Tank 011 - Diesel tank (north of Building 883) was closed sometime prior to 1981. It is unclear whether this tank was closed in accordance with current RCRA requirements.
- Tank 013 - Concrete Foundation Drain Tank north of Building 881. The concrete foundation drain is located just south of Building 883 and is believed to be part of the 883 foundation drain system and may or may not be part of the 881 foundation drain system.
- Tank 016 - Foundation Sump Tank, Groundwater (southwest corner of Bb883). This foundation sump tank is still active.

11.0 INDUSTRIAL HAZARDOUS SUBSTANCE SITES (IHSS), POTENTIAL AREAS OF CONTAMINATION (PAC) AND UNDER BUILDING CONTAMINATION (UBC)

The Building 883 cluster has several IHSSs, PAC, and UBC that are either in the buildings, under the buildings, or close enough to the buildings, to warrant mention in this report. Additional information can be found in the individual IHSS/PAC reports. Many of these IHSS, PACs, and UBCs are not within the scope of this project. They have been identified to provide general information about events, which have occurred in the vicinity of the 865 Cluster facilities.

UBC

Building 883 is on the UBC list as UBC-883. B879 is not on the UBC list. The UBC list is not intended to be a complete list of buildings with UBC, but rather a list of buildings whose operating history or historical event show that UBC may likely exists.

- UBC 883. Building 883 housed general rolling, forming, and forging operations. This UBC is Active, but out of the scope of this project.

On October 27, 1989, process waste water was noted to be overflowing from a tank in Room 139. Most of the water stayed within the bermed area. Some of the water flowed under the wall onto the concrete flooring in room 138. This incident resulted in the filing of a RCRA Contingency Plan Implementation Report (89-018).

IHSS and PAC

- IHSS/PAC 800-180 "Building 883 Drum Storage Area": 1981- 1995. The OU -15 CAD/ROD deferred action until D&D. The NFA for this IHSS will be submitted for approval in the 2001 HRR annual update.

The Building 883 Storage Area was first used in 1981 and since has been used as a RCRA 90-Day Accumulation Area. The storage area occupies Room 104, which measures 16 feet by 10 feet. The drum stored in this IHSS contained oil contaminated with solvents, uranium, and beryllium. There have been not document releases or visual evidence of a release. Some survey and smear samples have been collected at this location.

- IHSS/PAC 800-1200 "Valve Vault 2": April 25, 1987. This IHSS is active.

During a routine inspection of Valve Vault 2 liquid was detected in the leak detection collection jar. The collection jar was also found to be leaking. The leak was coming from the south process transfer line that originates from waste tanks in Building 883. Three discharges had occurred through this line since the last vault inspection.

- IHSS/PAC# 800-1201 "Radioactive Site South of Building 883": 1958 to 1981. This IHSS is active.

Low levels of soil contamination in the area between building 883 and 881 have been documented as early as 1958, possibly caused by the plutonium fire in 1957.

- IHSS/PAC 800-1202 "Sulfuric Acid Spill, Building 883": October 21, 1985. This IHSS was approved NFA in 1992.

A battery fell from a forklift or truck. Acid was spilled in the middle of the roadway outside Door#11. Approximately 1 quart to ½ gallon was spilled. Sodium Bicarbonate was applied to the spill and the area was washed down

- IHSS/PAC# 800-1206 "Fire, Building 883" October 1982. This IHSS was classified NFA in 1992.

A contaminated trash container fire occurred in building 883 on October 27, 1982 during grinding operations. Maintenance personnel placed the container outside the building and called the fire department. No documentation was found that detailed constituents released except that the container contained contaminated trash.

- IHSS/PAC 800-1207 "Transformer 883-4": 1985 - 1988. This IHSS was proposed NFA in the 1996 HRR annual up-date and is awaiting approval.

Transformer 883-4 is located at the southeast corner of Building 883. Utilities reported that it might have leaked prior to being retro-filled. The transformer was moved (date unknown) to a new pad several feet to the west of its original pad. The original pad still remains in the gravel filled area east of the new pad.

- IHSS/PAC 800-1209 "Leaking transformers, 800 Area": Unknown - 1991. This IHSS was proposed NFA in the 1996 HRR annual up-date and is awaiting approval. This IHSS is out of the scope of this project.

Three transformers and switchgear apparatus are located one hundred feet north of building 883. Utilities personnel reported that all components within this complex might have leaked prior to being retro-filled in 1987. No documentation was found which indicated a release to the environment occurred at this site.

- IHSS/PAC 800-1211 "Capacitor leak, Building 883": July 5, 1988. This IHSS was approved NFA in 1992.

A capacitor was found leaking at the south entrance of building 883. A spill involved approximately one pint of oil. A smear revealed negative results for PCB's.

12.0 BUILDING 883 CLUSTER PRELIMINARY LIST OF POTENTIAL CONTAMINENTS OF CONCERN

	Building 883	Building 879	Building 883C	Building T883D	Tank 011	Tank 016
Asbestos	X	X	X	X		
Beryllium	X	X				
Lead						
Lead - paint	X	X		X		
Lead - electrical equipment	X	X	X	X		
Lead-processes (storage, operations, wastes)	X	X				
Lead - shielding						
PCBs						
PCBs - paint	X	X		X	X	
PCBs - equipment		X				
PCBs - ballasts	X	X		X		
VOAs		X			X	X
Semi-VOAs	X	X			X	X
Metals	X	X	X			X
Radiological						
Pu	X	X				X
U - 235	X	X				X
U - 238	X	X		X		X
U - 233						

Note: This is a preliminary list of potential COCs based on a review of the historical processes, the HRR, the facility WSRIC and the interviews. The characterization SMEs should evaluate/verify this information and modify this list during building walkdowns and characterization development appropriate.

Note: See facility WSRIC for additional information

Note: Lead in Paint will be managed in accordance with the RFETS Guidance Document 27 "Lead Based Paint (LBP) and LBP disposal".

13.0 WASTE VOLUMES FOR THE 883 CLUSTER BUILDINGS AND TANKS

Waste Volume Estimates and Material Types							
Facility	Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM	Other Waste
883	102,300	0	11,650	0	3,345	27,300 ¹	Urethane 19,225 c.f.
883C	95	0	2,400	0	0	TBD	Insulation 300 cu ft
879	3,000	0	2,300	950	0	TBD	Roofing-buildup 400 c.f. Insulation 1,300 c. f.
T883D	0	93	96	205	120	TBD	Insulation 300 c.f.
Tank 011	100	0	0	0	0	0	0
Tank 013	300	0	10	0	0	0	0
Tank 016	300	0	10	0	0	0	0

¹ Volumes are estimates.

Prepared By: Doug Bryant July 2001

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D&D RISS Facility Characterization Historical Site Assessment - Interview Checklist

Facility ID: Building 883 Cluster, Includes: B883, B883C Cooling Tower, B879 Filter Plenum for B883, T-883D, Diesel Tank 011 (north of B883), Argon Tank 012 (north of B883), Foundation Sump Tank 016 (southwest corner of B883), Tank 020 Nitric Acid for B883, Tank 021 Nitric Acid for B883, Process Waste Sump Tank 312 (UST 62 - B889), Process Waste Sump Tank 312 (UST 63 - B889).

Anticipated Facility Type (1, 2, or 3): B883 = Type 3, B883C Cooling Tower = Type 1, B879 Filter Plenum for B883 = Type 3, T-883D = Type 1, Tank 011 = Type 1, Tank 012 = Type 1, Tank 016 = Type 2, Tank 020 = Type 1, Tank 021 = Type 1, Tank 312 = Type 2, Tank 313 = Type 2

This facility specific Historical Site Assessment (HSA) - Interview Checklist has been conducted in accordance with:
D&D Characterization Protocol, RFETS MAN-077-DDCP, latest version, and
Facility Disposition Program Manual, RFETS MAN-076-FDPM, latest version

Personnel Interviewed (Name, Title, and Function)

Richard A. Link, Radiological Engineer, Building Closure Support, RISS Closure Support, and PU&D Radiological Support

What time frame did the interviewee work in the facility? What was his/her function(s)?

Interviewee, Mr. Link, worked in B883 from 1962 until 1985 for approximately 23 years as the Health Physics Representative for the B883 Cluster.

Has the building configuration changed since you worked in the building (e.g., rooms & equipment)? Have there been any building renovations? If so, in what way? Yes according to interviewee, Mr. Link, the "C" Side was added and the B879 Filter Plenum was added. Mr. Link also stated that the "C" Side was mostly non-radioactive special projects, but he was aware that Be contamination has been found in the "C" Side.

What operations/processes were conducted in the building during the interviewee's time in the facility?

Some enriched U processing such as rolling, forming parts, and the shearing of rolled ingots. This processing included nitric acid pickling and salt baths for treating parts and ingots. A great deal of work was performed with depleted U as well. Mr. Link also said a lot of stainless steel and Be "canned" in stainless steel work was also done.

What types of equipment were used, and where was the equipment located? (specific rooms/areas)

Interviewee, Mr. Link, stated that in Rooms 102 and 109 were a 1000-Ton Mar-Form presses that routinely formed ½" thick hemi-shells of lead for certain projects. Mr. Link further stated that the formed lead hemi-shells were frequently difficult to remove from the forming punches; in one instance the lead part was cut off with a cutting torch.

Were any radioactive materials or equipment handled in the building (e.g., wastes, residues, product, feed material, sealed radioactive sources)? If so, what types and where? According to the interviewee, Mr. Link, the 4-H Mill in Room 112 was used to roll enriched U ingots that were Pu contaminated. Mr. Link said that the pure beta emitters, Strontium-90, Tritium (H-3), Phosphorous-32, nickel-63 and mixed fission products Cesium-137, Cobalt-60, and Technetium-99 were present in the ppb range as impurities in all the radioactive materials worked with.

Were there any Research & Development area (past or present) located in the facility or area? If so, where?

Yes, interviewee Mr. Link stated that routinely R&D work was performed in B883. Mr. Link said he was not aware of any R&D work being performed in any of the other B883 Cluster facilities.

**D&D RISS Facility Characterization
Historical Site Assessment - Interview Checklist**

Were any chemicals (e.g., Beryllium, RCRA/CERCLA Constituents, PCBs, etc.) handled in the building? If so, what types and where? Interviewee, Mr. Link, said that nitric acid and hydrochloric acids were used for leaching/cleaning and pickling parts and ingots in B883. Bases were used for neutralizing spent or dirty acid solutions. Salt baths containing sodium, lithium, and potassium carbonates were used for treatment of metal ingots and parts. Mr. Link said that he felt that these were RCRA/CERCLA constituents. Mr. Link said that he thought that B883 would have lighting ballasts that contain PCBs. Mr. Link said he was not aware of other sources of PCBs in B883 or any of the other B883 Cluster facilities.

Were there any Asbestos Containing Materials (e.g., transite wall board, ceiling tiles, floor tile), lead shielding, equipment utilizing PCB oils (e.g., process equipment, lifts, hydraulic systems, etc.), or any other chemical hazards (past or present)? Interviewee, Mr. Link, said he was aware of much asbestos containing materials of construction both inside and outside of B883. Mr. Link said that he felt that asbestos floor tiles were used in many areas in B883. Mr. Link was not aware of any lead shielding in B883. Mr. Link said he did not know of equipment that utilized PCB oils in B883.

Did any spills or uncontrolled release of radioactive materials or chemicals occur while you worked in the building? If so, what types, quantities, and where? According to interviewee, Mr. Link, contamination spills did occur in B883. In some cases B883 spills involved the release of airborne U oxide. In addition, Mr. Link said spills of U degreasing solvents frequently occurred.

Were these spills/releases cleaned up or mitigated? If so, how, and to what extent? According to interviewee, Mr. Link, contamination spills were cleaned up using soap and water. He also stated that the B883 floors were cleaned daily.

Do you know of any additional issues, concerns, or process knowledge that could affect facility characterization? Interviewee, Mr. Link, said that the B883 air tunnel exhaust ducts, which are poured concrete, would be U, Be, and probably Pu contaminated. Mr. Link also stated that Rooms 106 and 108, the old plenum rooms, would also be U, Be, and probably Pu contaminated.

Prepared By:

Bob Sheets

Print Name

Signature

Date

D&D RISS Facility Characterization Historical Site Assessment - Interview Checklist

Facility ID: Building 883 Cluster, Includes: B883, B883C Cooling Tower, B879 Filter Plenum for B883, T-883D, Diesel Tank 011 (north of B883), Argon Tank 012 (north of B883), Foundation Sump Tank 016 (southwest corner of B883), Tank 020 Nitric Acid for B883, Tank 021 Nitric Acid for B883, Process Waste Sump Tank 312 (UST 62 - B889), Process Waste Sump Tank 312 (UST 63 - B889),

Anticipated Facility Type (1, 2, or 3): B883 = Type 3, B883C Cooling Tower = Type 1, B879 Filter Plenum for B883 = Type 3, T-883D = Type 1, Tank 011 = Type 1, Tank 012 = Type 1, Tank 016 = Type 2, Tank 020 = Type 1, Tank 021 = Type 1, Tank 312 = Type 2, Tank 313 = Type 2

This facility specific Historical Site Assessment (HSA) - Interview Checklist has been conducted in accordance with:
D&D Characterization Protocol, RFETS MAN-077-DDCP, latest version, and
Facility Disposition Program Manual, RFETS MAN-076-FDPM, latest version

Personnel Interviewed (Name, Title, and Function)

Michael S. Simmons, B883 Production Manager, Controlled all B883 Metallurgical Operations (1989 - 1992), Operations Manager, Directed D&D and refurbishment activities (1995 - 1998). (Current Function B771 D&D Oversight)

What time frame did the interviewee work in the facility? What was his/her function(s)?

Interviewee worked in B883 for approximately 12 years during the last 20 years. Interviewee worked in B883 as a Metallurgical Operator, as a Metallurgical Operations Foreman, and as an Operations Manager from 1995-1998, when major decontamination and cleanup activities were conducted. Most recent activity was preparation for the manufacture of Waste Shipping Containers ("Pipe Over-packs") in B883. The B883 Annex, includes Rooms 104, 104A, 130, 130A, 130B, and Room 135 was mainly support areas for the "A" and "B" sides of B883. Included in these areas were drill presses, band saws, lube storage, part presses, forklift battery chargers, and part storage.

Has the building configuration changed since you worked in the building (e.g., rooms & equipment)? Have there been any building renovations? If so, in what way? Yes according to interviewee Mr. Simmons, friable asbestos was identified and remediated in B883 during 1995 - 1996. All asbestos (insulation from scrapped furnaces, thermal insulation on pipe work, etc.) remediated and / or removed was performed using State Certified Asbestos Workers and Supervisors. The entire facility (B883) was cleaned and decontaminated for Be and PCBs, as well as accessible radioactive removable contamination, including disassembly and renovation of all remaining major pieces of equipment. Historically Rooms 106 and 108 contained Filter Plenum 1 and Filter Plenum 2 respectively, after the construction of B879 this facility became the filter plenum facility for B883. The original Plenum areas were converted to storage. B883C is the cooling tower facility for B883 and B881. T883D is the Restroom Facility for the Office Trailers T-883A, T883B, and Trailer T-883C (which was relocated to B771 Trailer Park is has been renamed T-771Q).

What operations/processes were conducted in the building during the interviewee's time in the facility?

None of the Enriched U, Depleted U, uranium alloy, stainless steel, vanadium, tantalum, or beryllium rolling and forming, machining, shearing, grit blasting, acid and detergent cleaning was conducted in the last 13 years, but historically all of them were performed in the "A", "B", and Annex sides of B883.

What types of equipment were used, and where was the equipment located? (specific rooms/areas)

A rolling mill was located in Room 105 of "A" Side and a rolling mill was located also located in Room 112 of the "B" Side. Part presses were located in Rooms 109 and 102 of Sides "A" and "B" respectively. Salt baths are located on both "A" and "B" sides near the mills, and several shears, furnaces and other miscellaneous equipment are present in the facility.

D&D RISS Facility Characterization Historical Site Assessment - Interview Checklist

Were any radioactive materials or equipment handled in the building (e.g., wastes, residues, product, feed material, sealed radioactive sources)? If so, what types and where? According to the interviewee, the rolling, forming, machining, leaching, and heat treating of Depleted U was performed on the "A" Side of B883, Rooms 203, 104, 105, 109, and Room 130. The rolling, forming, leaching, and heat treating of Enriched U was performed on the "B" Side of B883, Rooms 102, 111, and Room 112 prior to 1967. Depleted U operations took place on "B" and "C" sides during the 1980's. Low values of Pu were detected in the "B" press ventilation system during renovation activities, thought to be caused by inadequately decontaminated Enriched Uranium parts that were crushed on the press in the past. In addition, radioactive exhaust air would have been routed to B879 for HEPA filtration before exhausting to the outside atmosphere.

Were there any Research & Development area (past or present) located in the facility or area? If so, where? Yes, in the approximately 33% of the work performed in B883 was for Research & Development and Special Order Work. Generally, due to the nature of the R&D work, all major pieces of equipment were utilized. No, in the present no work of any kind is going on in B883 (Unless some equipment removal in preparation for D&D has begun, like what is being done in B881.).

Were any chemicals (e.g., Beryllium, RCRA/CERCLA Constituents, PCBs, etc.) handled in the building? If so, what types and where? Beryllium was rolled, pressed, acid etched and cleaned in the facility, primarily on the "B" side during the 1968 - 1979 time frame. Yes, nitric acid and hydrochloric acids were used for leaching/cleaning parts and ingots in B883. Bases were used for neutralizing spent or dirty acid solutions. Salt baths containing sodium, lithium, and potassium carbonates were used for treatment of metal ingots and parts. PCB oil was used in the two Clearing presses on "A" side, however the oil was flushed by GE in the early 1980's and replaced with non-PCB oil. Minor PCB contamination exists in the Clearing press pits. RCRA regulated solvents (TCE, TCA, Carbon Tetrachloride, Freon, methylene chloride, toluene) were widely used in the facility, and were detected during the extensive facility characterization in 1995-1996. RCRA regulated metals (lead, silver, cadmium, chromium, barium) were found in lubrication oils, waste tank sludges, floor and equipment surfaces during D&D and renovation activities.

Were there any Asbestos Containing Materials (e.g., transite wall board, ceiling tiles, floor tile), lead shielding, equipment utilizing PCB oils (e.g., process equipment, lifts, hydraulic systems, etc.), or any other chemical hazards (past or present)? Yes in B883, asbestos was identified and remediated or removed during D&D and renovation activities. The entire facility was cleaned and decontaminated for Be and PCBs. All asbestos (insulation from scrapped furnaces, thermal insulation on pipe work, etc.) was removed using State Certified Asbestos Workers and Supervisors. A tremendous amount of Transite® wall board still exists in B883 (both interior, partition, and exterior walls are constructed from Transite® which considered non-friable ACM. Interviewee, Mr. Simmons, did not know if B879 or T-883D contains any asbestos, but he assumed that the B883C Cooling Tower did contain ACM. Due to when B879 was constructed (1982) it is unlikely that ACM exists in the building. PCB oil was used in the two Clearing presses on "A" side, however the oil was flushed by General Electric in the early 1980's and replaced with non-PCB oil. Minor PCB contamination exists in the Clearing press pits.

Did any spills or uncontrolled release of radioactive materials or chemicals occur while you worked in the building? If so, what types, quantities, and where? According to the interviewee, Michael Simmons, spills of nitric acid that were in some cases were Depleted/U and Enriched U contaminated would have occurred in B883, in Room 110. The nitric acid bath tank had a caustic scrubber (potassium hydroxide) to remove acid fumes. Acid baths were neutralized in another tank in Room 110 and the process waste tanks have been removed from the basement. Mr. Simmons stated that many other process tanks have been removed from B883 as well. Several areas of the facility had routine spills including the Annex (oil room), basement (waste tanks), solvents (degreasers, presses), and press pits.

D&D RISS Facility Characterization Historical Site Assessment - Interview Checklist

Were these spills/releases cleaned up or mitigated? If so, how, and to what extent?

According to the interviewee, Mr. Simmons, many spills have occurred and they would have been cleaned up with manual and / or vacuum pickup methods with the Operators using varying levels of PPE during cleanup operations. After acid cleanup/pickup floors and equipment were generally washed with soap and water. Some spilled acid solutions would have been neutralized with potassium hydroxide and put into waste processing tanks.

Do you know of any additional issues, concerns, or process knowledge that could affect facility characterization?

Interviewee, Michael Simmons, feels that on the "B" side near the etching baths and under the concrete slabs that there would probably be Be and Enriched U contamination. Mr. Simmons also stated that one piece of exhaust ductwork from the "B" press was found to have low levels of Pu contamination. All hydraulic systems, according to Mr. Simmons, in B883 have been drained, but will need to be refilled for dismantlement and D&D of the huge equipment items. During characterization efforts in 1995 there was some evidence to indicate that below grade pits have been filled with concrete or other materials, especially on "B" side. Debris might have been included in the fill material. Substantial changes to the configuration of the facility have led to some areas not included in the present CA to have radioactive contamination under paint, or in inaccessible areas. It is almost a certainty that underslab contamination of radioactive and / or other regulated materials exists, especially in the basement, mill pits, press pits and exhaust tunnels on "A" and "B" sides of the facility.

Prepared By:

Bob Sheets

Print Name

Bob Sheets

Signature

5/10/2001

Date

**D&D RISS Facility Characterization
Historical Site Assessment - Interview Checklist**

Facility ID: 883 Cluster

Anticipated Facility Type (1, 2, or 3): 2

This facility specific Historical Site Assessment (HSA) - Interview Checklist has been conducted in accordance with:
D&D Characterization Protocol, RFETS MAN-077-DDCP, latest version, and
Facility Disposition Program Manual, RFETS MAN-076-FDPM, latest version

Personnel Interviewed (Name, Title, and Function)

Gary Konwinski, Facility Manager – Responsible for all building activities

What time frame did the interviewee work in the facility? What was his/her function(s)?

1998 to 2001

Has the building configuration changed since you worked in the building (e.g., rooms & equipment)? Have there been any building renovations? If so, in what way?

No, I was responsible for removing all residents from the buildings

What operations/processes were conducted in the building during the interviewee's time in the facility?

Property and equipment removal (approximately 5,000 items) Waste packing of about 100,000 pounds, oil draining of all equipment (9,000 gallons). Electrical disconnects of all non-essential equipment (about 20 items) Removal of 40 legacy waste containers.

What types of equipment were used, and where was the equipment located? (specific rooms/areas)

N/A

Were any radioactive materials or equipment handled in the building (e.g., wastes, residues, product, feed material, sealed radioactive sources)? If so, what types and where?

Yes, depleted uranium was the isotope. MSC did a study in 1997? That verified the only isotope in the building was depleted uranium, with the possibility of some plutonium in one air duct. There is a characterization letter to this affect in the building file.

Were there any Research & Development area (past or present) located in the facility or area? If so, where?

Yes, B883 was an R&D shop, in C-side and in the Annex.

Were any chemicals (e.g., Beryllium, RCRA/CERCLA Constituents, PCBs, etc.) handled in the building? If so, what types and where?

Yes, beryllium was located throughout the entire building and its use is well documented. All elemental beryllium has been removed with the exception of residual "dust". Several RCRA waste streams were managed in the building, all of which have been removed. To my knowledge there is no residual remaining.

D&D RISS Facility Characterization Historical Site Assessment - Interview Checklist

Were there any Asbestos Containing Materials (e.g., transite wall board, ceiling tiles, floor tile), lead shielding, equipment utilizing PCB oils (e.g., process equipment, lifts, hydraulic systems, etc.), or any other chemical hazards (past or present)?

Yes, floor tiles and pipe insulation. No lead shielding, but lead blocks were located all over the building. This lead was waste packed and removed from the building. PCB oil was contained in one press, this oil was drained (about 1,200 gallons). The oil tested from 40 ppm to 125 ppm PCB. It was removed from the building and recycled.

Did any spills or uncontrolled release of radioactive materials or chemicals occur while you worked in the building? If so, what types, quantities, and where?

There was a failure of a condensate return line in 1998. This event released about 1,000 gallons of water into the CA. Clean-up efforts took place that day, and night. Water was containerized and shipped to Building 374 for treatment.

Were these spills/releases cleaned up or mitigated? If so, how, and to what extent?

See above.

Do you know of any additional issues, concerns, or process knowledge that could affect facility characterization?

Yes, significant mounts of data were collected by MSC. These data should be reviewed for characterization.

Prepared By:

Duane Parsons

Print Name

Duane Parsons

Signature

5/31/01

Date

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D&D RISS Facility Characterization Historical Site Assessment - Interview Checklist

Facility ID: B883

Anticipated Facility Type (1, 2, or 3): Type 2

This facility specific Historical Site Assessment (HSA) - Interview Checklist has been conducted in accordance with:
D&D Characterization Protocol, RFETS MAN-077-DDCP, latest version, and
Facility Disposition Program Manual, RFETS MAN-076-FDPM, latest version

Personnel Interviewed (Name, Title, and Function)

Dick Link was interviewed to clarify two statements that were made during his interview dated 5/10/01 (performed by Bob Sheets). In attendance at this clarification interview was Dick Link, Jay Britten, Duane Parsons, and Doug Bryant.

What time frame did the interviewee work in the facility? What was his/her function(s)?

Mr. Link worked at B883 from 1962 until 1985 as the Health Physics representative for the B883 Cluster.

Has the building configuration changed since you worked in the building (e.g., rooms & equipment)? Have there been any building renovations? If so, in what way?

Not Discussed.

What operations/processes were conducted in the building during the interviewee's time in the facility?

Not Discussed.

What types of equipment were used, and where was the equipment located? (specific rooms/areas)

Not Discussed.

Were any radioactive materials or equipment handled in the building (e.g., wastes, residues, product, feed material, sealed radioactive sources)? If so, what types and where?

Clarification 1 - In the Dick Link interview dated 5/10/01, the interviewer wrote that the 4-H Mill (also known as the HPM Press) may have low levels of Pu cross-contamination for working with Uranium material which had Pu contamination on it. The sampling strategy to address this Pu cross-contamination will be detailed in the B883 Cluster Characterization Plan.

Clarification 2 - In the Dick Link interview data 5/10/01, the interviewer wrote that Mr. Link said that the pure beta emitters, Strontium-90, Tritium (H-3), Phosphorous-32, nickel-63 and mixed fission products Cesium-137, Cobalt-60, and Technetium-99 were present in the ppb range as impurities in all the radioactive materials worked. After further clarification, Mr. Link stated that the impurities in the depleted Uranium material were in the ppb range relative to the uranium material as a whole. In relation to the total specific activity of the uranium material, the potential impurities were at such minute levels, the elimination of these impurities as contaminants of concern can be allowed. See the B883 Radiological Characterization Plan for more details.

**D&D RISS Facility Characterization
Historical Site Assessment - Interview Checklist**

Were there any Research & Development area (past or present) located in the facility or area? If so, where? <u>Not Discussed.</u>
Were any chemicals (e.g., Beryllium, RCRA/CERCLA Constituents, PCBs, etc.) handled in the building? If so, what types and where? <u>Not Discussed.</u>
Were there any Asbestos Containing Materials (e.g., transite wall board, ceiling tiles, floor tile), lead shielding, equipment utilizing PCB oils (e.g., process equipment, lifts, hydraulic systems, etc.), or any other chemical hazards (past or present)? <u>Not Discussed.</u>
Did any spills or uncontrolled release of radioactive materials or chemicals occur while you worked in the building? If so, what types, quantities, and where? <u>Not Discussed.</u>
Were these spills/releases cleaned up or mitigated? If so, how, and to what extent? <u>Not Discussed.</u>
Do you know of any additional issues, concerns, or process knowledge that could affect facility characterization? <u>Not Discussed.</u>

Prepared By:

Doug Bryant
Print Name

Doug Bryant
Signature

7-9-01
Date

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ATTACHMENT C

Radiological Characterization Package

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Rocky Flats Environmental Technology Site

RECONNAISSANCE LEVEL CHARACTERIZATION

RADIOLOGICAL CHARACTERIZATION PLAN
(PACKAGE)

883 CLUSTER CLOSURE PROJECT
(B883 & B879)

REVISION 2

August 13, 2001

Prepared by:

J. M. Britten
Jay Britten, Radiological Engineer

Date: 8/13/01

Reviewed by:

Duane Parsons
Duane Parsons, Facility Characterization Coordinator

Date: 8/13/01

Reviewed by:

Paul Miles
Paul Miles, Quality Assurance

Date: 8/13/01

Approved by:

Kent Dorr
Kent Dorr, Closure Project Manager

Date: 8/14/01

REVIEWED FOR CLASSIFICATION

By *K.A. Dorr* *END*

Date 8/14/01

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RLC Radiological Characterization Plan (Package)
883 Cluster
(B883 & B879)

Note and Assumptions:

- * This characterization package was prepared in accordance with MAN-077-DDCP, D&D Characterization Protocols, and Appendix D, Reconnaissance Level Characterization Plan for D&D Facilities, latest versions.
- * RLCP Data Quality Objectives were used to develop this characterization package.
- * Some interior facility characterization data of 883 already exists, only RLC data gaps are specified in this characterization plan. The RLCR will report both existing data and newly acquired RLC data, as necessary. Interior facility characterization surveys of 879 will be obtained. Exterior facility characterization surveys of the 883 Cluster will be obtained by the D&D Program Office as part of a site-wide Technical Basis Document development effort. The 883 Cluster exterior facility characterization survey results will also be reported in the 883 Cluster RLCR.
- * It is assumed that all facility systems are potentially contaminated and will be disposed of as LLW or LLMW, and will not affect the facility typing determination. Therefore, only exterior surfaces of facility system piping, ducting, conduit, plenums, equipment, etc. will be considered during the RLC.
- * It is assumed that all painted surfaces in potential MARSSIM Class 1 and Class 2 PDS survey areas will either be stripped or disposed of as LLW or LLMW during in-process D&D work. Therefore, media and volumetric sampling will not be considered during the RLC.
- * Only facilities that are anticipated to be Type 2 facilities were considered in this RLC Plan. Anticipated Type 1 facilities (i.e., 883C, Tank 011) will be characterized as part of the Pre-demolition Survey Plan for the cluster.

Instructions:

1. Verify characterization activities are on the Plan-of-the-Day (POD).
2. Perform a Pre-Evolution Brief and/or Job Task Brief in accordance with the Site Conduct of Operations Manual.
3. Verify personnel have appropriate training for the applicable tasks they will be performing.
4. Comply with RWP requirements, if applicable.
5. Comply with facility PPE requirements, as applicable.
6. Inform the Facility Manager, or designee prior to starting characterization activities.
7. Follow applicable characterization and sampling procedures (RSP 16.02).
8. Have D&D craft perform the following, as required:
 - * Lift deck grating and access covers to assist in obtaining samples in trenches, pits & sumps. Use forklift with approved lift attachment, as necessary.
 - * Cut (using sawsall) deck grating and access covers, if necessary, to assist in obtaining samples in trenches, pits & sumps.
 - * Assist in accessing ventilation ducts for sampling, including removal of blank flanges via the use of scaffolding, ladders or other suitable means.

NOTE:

Craft and/or sample personnel may be required to enter into trenches, sumps, & pits to obtain samples.

9. Obtain and comply with the requirements of the Confined Space Entry Permit in accordance with requirements (OS&H PM, Chapter 21, "Confined Space Entry Program), as applicable.
10. Notify Wackenhut Security (x2444) and the Shift Supervisor (x2914), and verify appropriate safety precautions/requirements are followed prior to accessing facility roofs.
11. Coordination with the Environmental Restoration Program organization will be required to further characterize underneath facility foundations and slabs prior to removal.
12. Collect and maintain all characterization paperwork in the Project File(s).
13. All radiological surveys shall be conducted in accordance with the sampling and instruction forms included in 883 Cluster Survey Area Packages. Sample locations are denoted on maps attached to each survey area package.

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RLC Radiological Characterization Plan (Package)

883 Cluster

(B883 & B879)

Non-Contamination Areas, Buffer Areas, and RMAs

Survey Area	Description	Floor m ²	Scan m ²	TSA	Smears	Media
D	Interior of B879	127	30	70	70	N/A
	Totals	127	30	70	70	0

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RLC Radiological Characterization Plan (Package)**883 Cluster**

(B883 & B879)

Contamination Areas and Fixed Contamination Areas

Survey Area	Description	Floor m ²	*Scan m ²	*TSA	*Smears	Media
F	883 Tenches, Sumps, Pits, & Interior of B-Side HPM Press Ventilation Duct and Room 102 floor (north end)	< 1000	30 (minimum)	30 (minimum)	30 (minimum)	N/A
Totals		< 1000	30	30	30	0

* A minimum of 30 points are required in this survey area; however, additional measurements may be required to adequately characterize all areas.

** All removable surface contamination measurements shall be analyzed for isotopic constituents to determine contaminant(s) of concern.

**Radiological Characterization Package
B883 & B879 Exterior Surveys**

Class 3 Areas

Survey Area	Survey Unit	Class	Description	Total m ²	Floor m ²	Scan m ²	TSA (α & β)	Smears (α & β)	Media	Class Justification
NA	883001	3	East one-story section 883 roof.	713	NA	36	15-random 2-QC	15-random	0	Areas are not expected to contain, or have ever contained, any residual radioactivity greater than the DCGL _w . Historical Site Assessment and process knowledge of this unit provide a high degree of confidence that no individual measurement will exceed the DCGL _w . A 5% scan will be biased towards areas of greater potential for contamination.
NA	883002	3	West one-story section 883 roof.	1117	NA	56	17-random 2-QC	17-random	0	Areas are not expected to contain, or have ever contained, any residual radioactivity greater than the DCGL _w . Historical Site Assessment and process knowledge of this unit provide a high degree of confidence that no individual measurement will exceed the DCGL _w . A 5% scan will be biased towards areas of greater potential for contamination.
NA	883003	3	North section of two-story 883 roof.	915	NA	46	15-random 2-QC	15-random	0	Areas are not expected to contain, or have ever contained, any residual radioactivity greater than the DCGL _w . Historical Site Assessment and process knowledge of this unit provide a high degree of confidence that no individual measurement will exceed the DCGL _w . A 5% scan will be biased towards areas of greater potential for contamination.
NA	883004	3	North central section of two-story 883 roof.	921	NA	46	15-random 2-QC	15-random	0	Areas are not expected to contain, or have ever contained, any residual radioactivity greater than the DCGL _w . Historical Site Assessment and process knowledge of this unit provide a high degree of confidence that no individual measurement will exceed the DCGL _w . A 5% scan will be biased towards areas of greater potential for contamination.
NA	883005	3	South section of two-story 883 roof.	778	NA	39	15-random 2-QC	15-random	0	Areas are not expected to contain, or have ever contained, any residual radioactivity greater than the DCGL _w . Historical Site Assessment and process knowledge of this unit provide a high degree of confidence that no individual measurement will exceed the DCGL _w . A 5% scan will be biased towards areas of greater potential for contamination.

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Radiological Characterization Package

B883 & B879 Exterior Surveys

NA	883006	3	Bldgs 879 (plenum) & T883D exteriors.	722	NA	36	15-random 2-QC	15-random	0	Areas are not expected to contain, or have ever contained, any residual radioactivity greater than the DCGL _w . Historical Site Assessment and process knowledge of this unit provide a high degree of confidence that no individual measurement will exceed the DCGL _w . A 5% scan will be biased towards areas of greater potential for contamination.
NA	883007	3	883 north & south facing walls.	1403	NA	70	21-random 2-QC	21-random	0	Areas are not expected to contain, or have ever contained, any residual radioactivity greater than the DCGL _w . Historical Site Assessment and process knowledge of this unit provide a high degree of confidence that no individual measurement will exceed the DCGL _w . A 5% scan will be biased towards areas of greater potential for contamination.
NA	883008	3	883 east facing walls.	1302	NA	65	20-random 2-QC	20-random	0	Areas are not expected to contain, or have ever contained, any residual radioactivity greater than the DCGL _w . Historical Site Assessment and process knowledge of this unit provide a high degree of confidence that no individual measurement will exceed the DCGL _w . A 5% scan will be biased towards areas of greater potential for contamination.
NA	883009	3	883 west facing walls.	1045	NA	52	16-random 2-QC	16-random	0	Areas are not expected to contain, or have ever contained, any residual radioactivity greater than the DCGL _w . Historical Site Assessment and process knowledge of this unit provide a high degree of confidence that no individual measurement will exceed the DCGL _w . A 5% scan will be biased towards areas of greater potential for contamination.
Class 3 Totals				8916	0	445.8	167	149	0	
All Class Areas				8916	0	445.8	167	149	0	

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ATTACHMENT D

Chemical Characterization Package

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Rocky Flats Environmental Technology Site

RECONNIASSINACE LEVEL CHARACTERIZATION

CHEMICAL CHARACTERIZATION PLAN (PACKAGE)

883 CLUSTER CLOSURE PROJECT (Buildings 883 and 879)

REVISION 2

August 13, 2001

Prepared by: David Babbs Date: 8/13/01
David Babbs, Industrial Hygiene

Prepared by: Matt Shaffer Date: 08/30/01
Matt Shaffer, Environmental Compliance

Reviewed by: Paul Miles Date: 8/14/01
Paul Miles, Quality Assurance

Reviewed by: Duane Parsons Date: 8/13/01
Duane Parsons, Characterization Coordinator

Approved by: Kent Dorr Date: 8/14/01
Kent Dorr, KH Closure Project Manager

RLC CHEMICAL CHARACTERIZATION PLAN (PACKAGE)

883 Cluster: (Buildings 883 and 879)

Notes and Assumptions:

- This characterization package was prepared in accordance with MAN-077-DDCP, D&D Characterization Protocols, and Appendix D, Reconnaissance Level Characterization Plan for D&D Facilities, April 23, 2001.
- RLCP Data Quality Objectives were used to develop this characterization package.
- Data already exists for some contaminants of concern, only RLC data gaps are specified in this characterization plan. If areas are discovered during the removal of plates, covers, etc. as the RLC progresses, these areas will be sampled as required with appropriate procedures detailed in this plan. The 883 Cluster RLCR will report both existing data results and newly acquired RLC data results.
- Components of RCRA Units were not considered within the scope of this RLC Plan since they are covered under the RCRA Closure Program. All RCRA permitted units in B883 have been characterized by the permitting process (i.e., approved waste codes). All RCRA units that have not been previously closed, will be closed in accordance with closure requirements specified in the Closure Plan, Section X, of the RCRA Part B Permit, which are also delineated in the RFCA RSOP for Component Removal, Decontamination and Size Reduction. Therefore, no additional chemical sampling is required for characterization.
- It is assumed that demolition debris will either be disposed of as PCB Bulk Product Waste or sampled during in-process characterization once site protocols are established based on current discussions with the Lead Regulatory Agencies concerning Building 111. Therefore painted concrete surfaces will not be sampled for PCBs in paint during the RLC. If it is later determined that concrete demolition debris will be used for onsite recycled fill material, then additional PCB sampling will take place during in-process characterization.
- Lead sampling is not required in the 883 Cluster. All paint will remain a part of the infrastructure during demolition and therefore does not require sampling per Environmental Waste Compliance Guidance No. 27, Lead Based Paint (LBP) and LBP Debris Disposal. Sampling for lead for IH requirements will be at the discretion of the demolition contractor.
- It is assumed that all potential materials that could contain ACM in B883 do contain ACM, therefore no additional asbestos sampling will be performed in B883.
- It is assumed that all facility systems are potentially contaminated and will be disposed of as LLW or LLMW and will not affect the facility typing determination. Therefore, only exterior surfaces of facility system piping, ducting, conduit, plenums, equipment, etc. will be considered during the RLC.
- Only facilities that are anticipated to be Type 2 facilities were considered in this RLC Plan. Anticipated Type 1 facilities (i.e., 883C and Tank 011) will be characterized as part of the Type 1 facility RLC/PDS effort later in the project schedule.

Instructions:

1. Verify characterization activities are on the Plan-of-the-Day (POD).
2. Perform a Pre-Evolution Brief and/or Job Task Brief in accordance with the Site Conduct of Operations Manual.
3. Verify personnel have appropriate training for the applicable tasks they will be performing.
4. Comply with RWP and Beryllium Work Form (BWF) requirements, if applicable.
5. Comply with facility PPE requirements, as applicable.
6. Inform the Facility Manager, or designee prior to starting characterization activities.

NOTE:

Craft and/or sample personnel may be required to enter into trenches, sumps, & pits to obtain samples. Obtain and comply with the requirements of the Confined Space Entry Permit in accordance with requirements (OS&IH PM, Chapter 21, "Confined Space Entry Program), as applicable.

7. Follow applicable characterization and sampling procedures.
8. Have D&D craft perform the following, as required:
 - Lift deck grating and access covers to assist in obtaining samples in trenches, pits & sumps. Use forklift with approved lift attachment, as necessary.
 - Cut (using sawsall) deck grating and access covers, if necessary, to assist in obtaining samples in trenches, pits & sumps.
 - Assist in accessing ventilation ducts for sampling, including removal of blank flanges of ventilation pipes via scaffolding, ladders, or other suitable means.
9. Notify Wackenhut Security (x2444) and the Shift Supervisor (x2914), and verify appropriate safety precautions/requirements are followed prior to accessing facility roofs.
10. Coordination with the Environmental Restoration Program organization will be required to further characterize soils around and underneath facility foundations and slabs prior to removal.
11. Collect and maintain all characterization paperwork in the Characterization Closure Project File(s), and all electronic data in the appropriate D&D RISS subdirectory.

ASBESTOS		
Sample Location	Number of Samples	Sample location and justification/rational
883	0	It is assumed that all potential materials that could contain asbestos in 883 do contain asbestos, therefore no additional asbestos sampling will be performed in 883.
879	5	A comprehensive asbestos building inspection has been performed. The east wall (14 ft high by 92 lineal feet) of the air handling equipment room adjacent to the plenum chamber is insulated with approximately 1,288 square feet of spray-on acoustical fireproofing. The wall substrate is concrete twin T's covered with a layer of styrofoam. The acoustical fireproofing is on the styrofoam. Five (5) random bulk samples were obtained for asbestos analysis.
Total Samples:	5	Sample locations were specified on sample maps during characterization efforts. Samples were obtained in accordance with PRO-653-ACPR, Asbestos Characterization Procedure, and 40 CFR Part 763, Subpart E.

BERYLLIUM		
Sample Location	Number of Samples (smears)	Sample location and justification/rational
879	26	There is sufficient process history that proves beryllium was used, stored, or contained in this building. Additional random and biased samples are required to further delineated potential Be contamination in specific areas not previously characterized.
883 trench, pits, and sumps, Room 102 vent duct	30 (minimum)	Additional biased samples are required to further delineated potential Be contamination in specific areas not previously characterized.
Total Samples:	56	Samples will be obtained at locations specified on sample map(s) in accordance with PRO-536-BCPR, Beryllium Characterization Procedure. Biased sample locations will correspond with the most probable areas of dust accumulation (including beryllium dust), assuming airborne deposition.

RCRA/CERCLA CONSTITUENTS		
Sample Location	Number of Samples	Sample location and justification/rational
883	1	<p>This facility was used primarily for manufacturing and metallurgical operations including rolling, shearing, forging, pressing, grinding, welding, heat treating, cleaning and weighing. The primary metal was depleted uranium, alloys of depleted uranium, niobium, enriched uranium, stainless steel, aluminum and vanadium. Site historical information indicates that hazardous materials were used, and process wastes and hazardous waste were generated during routine activities.</p> <p>During the B883 walk-down, used machine oil was identified in a grate-covered trench associated with the "blue" Extrusion Press. This liquid was removed, sampled, and analyzed for TCLP VOAs, SVOAs, metals (including mercury) and total PCBs. As of 25 July 2001, analytical results are pending. A fluid (assumed to be hydraulic oil) was also discovered at the base of the elevator shaft and will be sampled for TCLP VOAs, SVOAs, metals, and total PCBs. As of 25 July 2001, sampling and analysis are pending.</p> <p>It is noted that many areas of B883 were inaccessible during the RLC planning walk-down (e.g., pits, trenches, sumps, utility chases, tunnels, etc.). These areas will be characterized for RCRA chemicals during the RLC for Be and radiological contaminants if any sludges, liquids, and/or staining on concrete (indicating chemical residue) are discovered.</p>
879	0	Based on historical process information, no unremediated spills have occurred in this building and visual observation indicated no evidence of spills (e.g., staining). It is recognized that during D&D activities evidence of past spills <i>may</i> become apparent and will be characterized at that time.
Total Samples:	1	

64
67

PCBs		
Sample Location	Number of Samples	Sample location and justification/rational
883, 879	1	<p>The "Cleaning Press" located in room 105 is still in-place and is known (via previous sampling) to have contained PCB oil. While this oil has been drained, there is a potential for oily residue in the Cleaning Press pit/sump. The pit is located beneath the press and may contain PCB oil that leaked from the machine during its operational history. This pit as well as many other pits, trenches, sumps, utility chases, and tunnels were inaccessible during the RLC planning walk-down. However, during the RLC for Be and radiological contaminants, these inaccessible areas will be made accessible for sampling. Any sludges, liquids, and/or concrete (indicating chemical residue) will be characterized for PCBs as they are discovered and as appropriate.</p> <p>It is noted that based on historical process information, no other unremediated PCB spills have occurred in these buildings and visual observation indicated no evidence of spills (e.g., staining). It is recognized that during D&D activities evidence of past spills <i>may</i> become apparent and will be characterized at that time.</p>
Total Samples:	1	

- PCB ballasts, fluorescent light bulbs, potential mercury switches in thermostats, and mercury vapor light bulbs will be identified and removed prior to demolition.

68

ATTACHMENT E

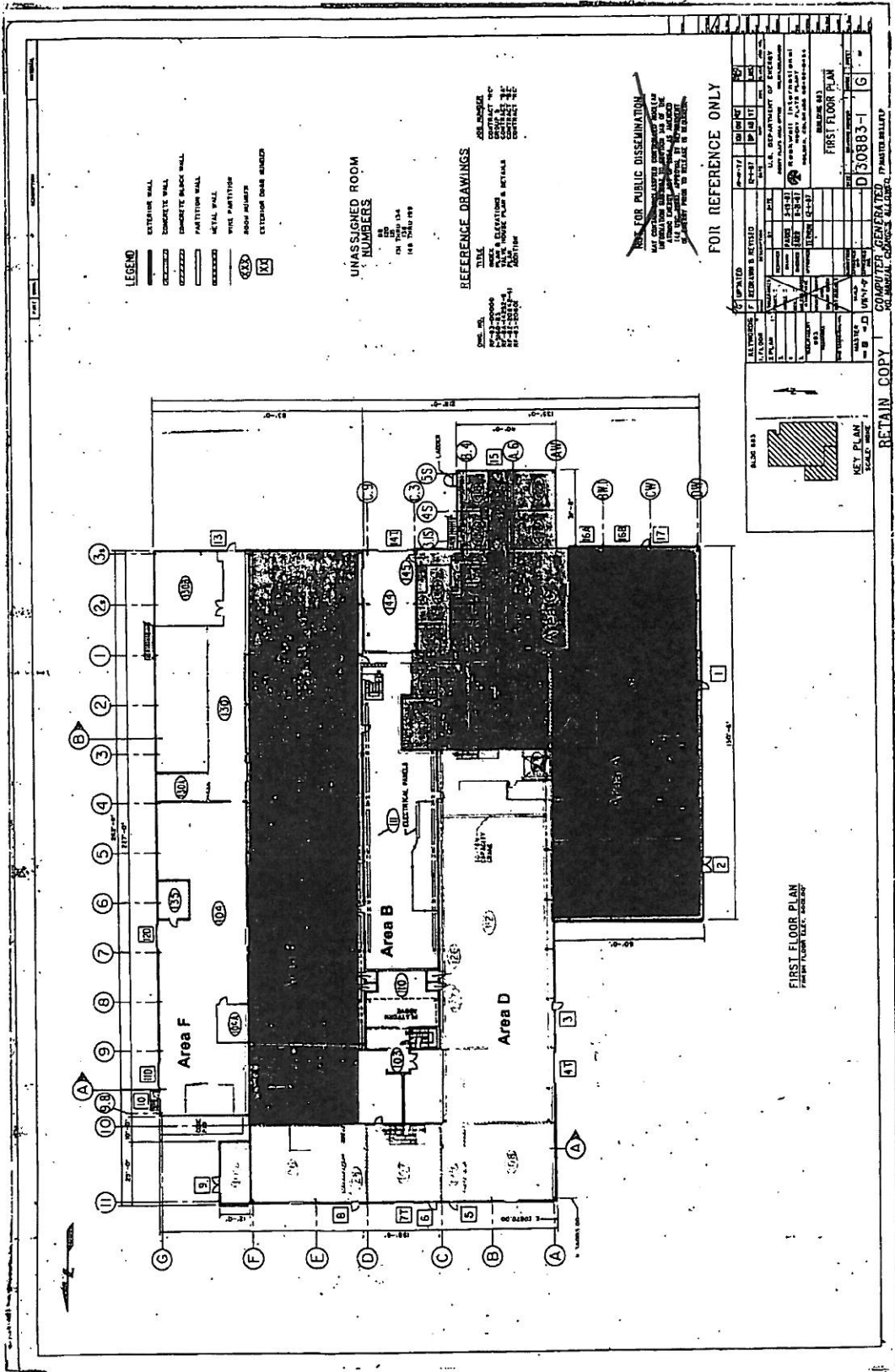
Radiological Data Summaries and Survey Maps

table 69

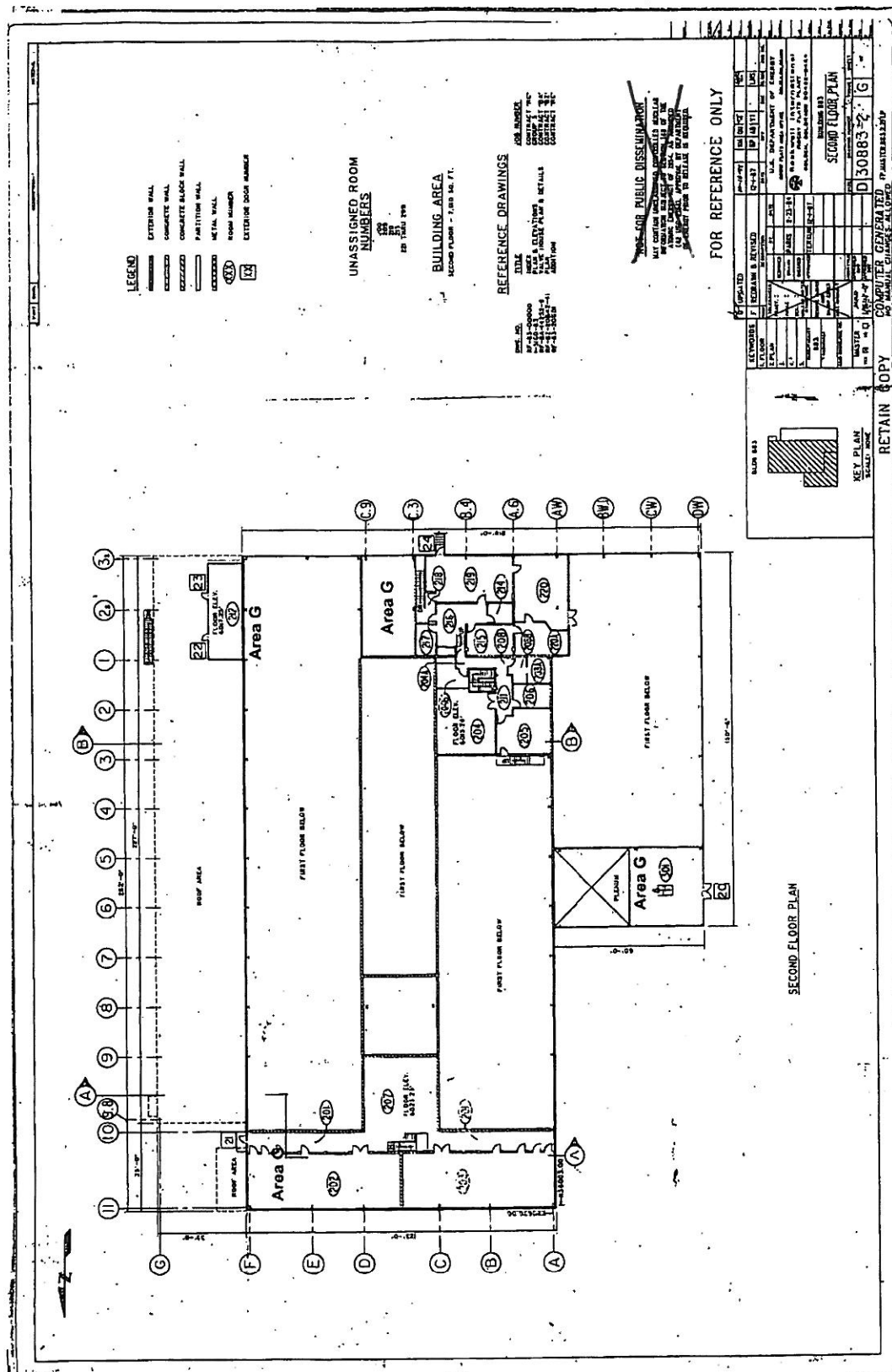
ATTACHMENT E-1

MSC and ORNL Data and Maps

~~67~~
70



68
71



DOES NOT CONTAIN
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION

Reviewing Official: J. A. NESHEIM
Name: *EMC/Classified*
Date: 10-13-08

69
72



UNASSIGNED ROOM:
NUMBERS
10 THRU 99

BUILDING AREA
BASEMENT - 7,600 SQ. FT.

REFERENCE DRAWINGS

ITEM	QTY.	UNIT	TITLE	FOR BUDGET
1.			RF-33-00030	CONTRACT "C"
2.			1-510-13	GROUP 3
3.			RF-33-04752-9	CONTRACT "B"
4.			RF-33-30642-41	CONTRACT "A"
			"INDEX PLAN & ELEVATIONS VALVE HOUSE PLAN & DETAILS PLAN	

**DOES NOT CONTAIN
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION**

~~NOT FOR PUBLIC DISSEMINATION~~
MAY CONTAIN UNCLASSIFIED-CONTROLLED NOTICES
INFORMATION 019 MAY 10 1980 146 OF THE
ATOMIC ENERGY ACT OF 1954. (U.S. ARMS)
(U.S. ARMS) APPROVAL BY DEPARTMENT
OF ENERGY PRIOR TO RELEASE IS REQUIRED.

Reviewing
Official: J. A. NESHEIM
ENC. GC Admin Name Office
Date: 10-13-08

FOR REFERENCE ONLY

FINISH FLOOR ELEVATION
FIN. FL. CTRY. 3100.00

[illegible][illegible]

2000

5

Table E-1 B883 Radiological Data Summary, MSC Data, >2 meters

SECTION	A	B	C	D	E	F	G	H
Alpha TSAs								
Number of Alpha TSA Samples:	392	647	214	1162	860	352	631	391
Minimum Alpha TSA Value (dpm/100cm ²):	0	0	0	0	0	0	0	0
Maximum Alpha TSA Value (dpm/100cm ²):	761	3894	256	3539	28344	2078	517	700
Number of Alpha TSA Samples >5000 dpm/100cm ² :	0	0	0	0	40	0	0	0
Number of Alpha TSA Samples >500,000 dpm/100cm ² :	0	0	0	0	0	0	0	0

Beta TSAs								
Number of Beta TSA Samples:	392	647	214	1162	860	352	631	391
Minimum Beta TSA Value (dpm/100cm ²):	0	0	0	0	0	0	0	0
Maximum Beta TSA Value (dpm/100cm ²):	24,000	33,333	4291	3487878	101212	227273	3633	14303
Number of Beta TSA Samples >5000 dpm/100cm ² :	3	122	0	34	392	86	0	6
Number of Beta TSA Samples >500,000 dpm/100cm ² :	0	0	0	1	0	0	0	0

Alpha Smears								
Number of Alpha Smear Samples:	270	675	224	1162	860	352	887	319
Minimum Alpha Smear Value (dpm/100cm ²):	114	0	0	0	0	0	0	0
Maximum Alpha Smear Value (dpm/100cm ²):	0	1220	25	127	1290	258	195	4796
Number of Alpha Smears >1,000 dpm/100cm ² :	0	1	0	0	46	0	0	1
Number of Alpha Smears >100,000 dpm/100cm ² :	0	0	0	0	0	0	0	0

Beta Smears								
Number of Beta Smear Samples:	270	675	224	1162	860	352	887	319
Minimum Beta Smear Value (dpm/100cm ²):	0	0	0	0	0	0	0	10085
Maximum Beta Smear Value (dpm/100cm ²):	1080	2339	50	185	2845	377	147	1
Number of Beta Smears >1,000 dpm/100cm ² :	1	5	0	0	32	0	0	0
Number of Beta Smears >100,000 dpm/100cm ² :	0	0	0	0	0	0	0	0

Alpha Scans								
Number of 1 Meter Alpha Scans:	124	185	224	916	860	10	613	99
Maximum 1 Meter Alpha Scan Value (dpm/100cm ²):	39	1333	106	883	111,111	44	517	111
Number of 1 Meter Alpha Scans >5,000 dpm/100cm ² :	0	0	0	0	20	0	0	0
Number of 1 Meter Alpha Scans >500,000 dpm/100cm ² :	0	0	0	0	0	0	0	0

Beta Scans								
Number of 1 Meter Beta Scans:	124	185	224	916	860	10	613	99
Maximum 1 Meter Beta Scan Value (dpm/100cm ²):	4376	36364	4291	17472	275,455	96950	3633	14106
Number of 1 Meter Beta Scans >5,000 dpm/100cm ² :	0	0	0	60	247	6	0	2
Number of 1 Meter Beta Scans >500,000 dpm/100cm ² :	0	0	0	0	0	0	0	0

Table E-2 B883 Radiological Data Summary, MSC Data, <2 Meters

SURVEY AREA	B	D	G	H
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Alpha TSAs

Number of Alpha TSA Samples:	80	74	508	424
Minimum Alpha TSA Value (dpm/100cm ²):	0	0	0	0
Maximum Alpha TSA Value (dpm/100cm ²):	3933	2656	233	10289
Number of Alpha TSA Samples >5000 dpm/100cm ² :	0	0	0	3
Number of Alpha TSA Samples >500,000 dpm/100cm ² :	0	0	0	0

Beta TSAs

Number of Beta TSA Samples:	80	74	508	424
Minimum Beta TSA Value (dpm/100cm ²):	0	0	0	0
Maximum Beta TSA Value (dpm/100cm ²):	78788	275758	17791	454545
Number of Beta TSA Samples >5000 dpm/100cm ² :	21	47	1	91
Number of Beta TSA Samples >500,000 dpm/100cm ² :	0	0	0	0

Alpha Smears

Number of Alpha Smear Samples:	87	84	387	441
Minimum Alpha Smear Value (dpm/100cm ²):	3	0	0	0
Maximum Alpha Smear Value (dpm/100cm ²):	76	85	25	2556
Number of Alpha Smears >1,000 dpm/100cm ² :	0	0	0	4
Number of Alpha Smears >100,000 dpm/100cm ² :	0	0	0	0

Beta Smears

Number of Beta Smear Samples:	87	84	387	441
Minimum Beta Smear Value (dpm/100cm ²):	0	2	0	0
Maximum Beta Smear Value (dpm/100cm ²):	153	148	70	2330
Number of Beta Smears >1,000 dpm/100cm ² :	0	0	0	3
Number of Beta Smears >100,000 dpm/100cm ² :	0	0	0	0

Alpha Scans

Number of 1 Meter Alpha Scans:	80	74	508	230
Maximum 1 Meter Alpha Scan Value (dpm/100cm ²):	3933	2654	322	16667
Number of 1 Meter Alpha Scans >5,000 dpm/100cm ² :	0	0	0	8
Number of 1 Meter Alpha Scans >500,000 dpm/100cm ² :	0	0	0	0

Beta Scans

Number of 1 Meter Beta Scans:	80	74	508	230
Maximum 1 Meter Beta Scan Value (dpm/100cm ²):	78788	275758	17791	454545
Number of 1 Meter Beta Scans >5,000 dpm/100cm ² :	21	47	1	73
Number of 1 Meter Beta Scans >500,000 dpm/100cm ² :	0	0	0	0

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Table E-3 B883 Radiological Data Summary, MSC Data, Equipment

SURVEY AREA	A	B	D	F	G	H
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Alpha TSAs

Number of Alpha TSA Samples:	117	24	287	10	59	191
Minimum Alpha TSA Value (dpm/100cm ²):	0	11	0	17	0	0
Maximum Alpha TSA Value (dpm/100cm ²):	117	38888	1117	78	50	23600
Number of Alpha TSA Samples >5000 dpm/100cm ² :	0	1	0	0	0	5
Number of Alpha TSA Samples >500,000 dpm/100cm ² :	0	0	0	0	0	0

Beta TSAs

Number of Beta TSA Samples:	117	24	287	10	59	191
Minimum Beta TSA Value (dpm/100cm ²):	0	0	0	4648	0	0
Maximum Beta TSA Value (dpm/100cm ²):	3776	69697	3487878	18167	0	272727
Number of Beta TSA Samples >5000 dpm/100cm ² :	0	2	7	9	0	23
Number of Beta TSA Samples >500,000 dpm/100cm ² :	0	0	1	0	0	0

Alpha Smears

Number of Alpha Smear Samples:	117	24	287	10	61	192
Minimum Alpha Smear Value (dpm/100cm ²):	0	9	0	9	0	0
Maximum Alpha Smear Value (dpm/100cm ²):	22	2724	98	184	22	312
Number of Alpha Smears >1,000 dpm/100cm ² :	0	1	0	0	0	0
Number of Alpha Smears >100,000 dpm/100cm ² :	0	0	0	0	0	0

Beta Smears

Number of Beta Smear Samples:	117	24	287	10	61	192
Minimum Beta Smear Value (dpm/100cm ²):	0	14	0	7	0	0
Maximum Beta Smear Value (dpm/100cm ²):	130	2868	1024	332	45	240
Number of Beta Smears >1,000 dpm/100cm ² :	0	3	0	0	0	0
Number of Beta Smears >100,000 dpm/100cm ² :	0	0	0	0	0	0

Alpha Scans

Number of 1 Meter Alpha Scans:	0	0	0	0	0	29
Maximum 1 Meter Alpha Scan Value (dpm/100cm ²):						4000
Number of 1 Meter Alpha Scans >5,000 dpm/100cm ² :						0
Number of 1 Meter Alpha Scans >500,000 dpm/100cm ² :						0

Beta Scans

Number of 1 Meter Beta Scans:	0	0	0	0	0	29
Maximum 1 Meter Beta Scan Value (dpm/100cm ²):						7697
Number of 1 Meter Beta Scans >5,000 dpm/100cm ² :						1
Number of 1 Meter Beta Scans >500,000 dpm/100cm ² :						0

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76

Table E-4, B883 ORNL Summary Statistics, Survey Areas A-F

Room 104N Floor

Measurement	N	Units	Min ^a	Max	Mean	Std Dev
Beta	195	dpm/100cm ²	1439.0	500012.0	47653.5	81349.2
Alpha	54	dpm/100cm ²	300.0	5823.0	1860.2	1099.5
Removable Beta	46	dpm/100cm ²	32.0	760.0	254.1	156.7
Removable Alpha	46	dpm/100cm ²	9.0	516.0	145.0	98.2
Beryllium	47	ug/100cm ²	0.00005	0.00025	0.00011	0.00005

Room 104N Lower Walls

Measurement	N	Units	Min ^a	Max	Mean	Std Dev
Beta	118	dpm/100cm ²	-92.0	112116.0	4370.7	12156.4
Alpha	2	dpm/100cm ²	226.0	1345.0	785.5	559.5
Removable Beta	23	dpm/100cm ²	15.0	975.0	95.3	189.3
Removable Alpha	23	dpm/100cm ²	9.0	525.0	52.6	102.8
Beryllium	23	ug/100cm ²	0.00005	0.00027	0.00013	0.00003

Room 105A Floor

Measurement	N	Units	Min ^a	Max	Mean	Std Dev
Beta	402	dpm/100cm ²	307.0	868663.0	69626.8	110275.6
Alpha	137	dpm/100cm ²	190.0	53039.0	3872.2	6022.0
Removable Beta	80	dpm/100cm ²	25.0	922.0	171.4	151.2
Removable Alpha	80	dpm/100cm ²	3.0	426.0	103.1	80.1
Beryllium	80	ug/100cm ²	0.00005	0.00240	0.00051	0.00070

Room 105A Lower Walls

Measurement	N	Units	Min ^a	Max	Mean	Std Dev
Beta	150	dpm/100cm ²	116.0	203214.0	8650.4	21669.9
Alpha	16	dpm/100cm ²	197.0	23193.0	3973.5	5991.6
Removable Beta	30	dpm/100cm ²	12.0	9292.0	459.7	1645.4
Removable Alpha	30	dpm/100cm ²	12.0	372.0	88.5	79.6
Beryllium	30	ug/100cm ²	0.00005	0.00042	0.00010	0.00008

Room 111M Floor

Measurement	N	Units	Min ^a	Max	Mean	Std Dev
Beta	51	dpm/100cm ²	262.0	282155.0	14333.5	41262.4
Removable Beta	7	dpm/100cm ²	40.0	187.0	113.0	44.3
Removable Alpha	7	dpm/100cm ²	38.0	133.0	69.8	30.2
Beryllium	7	ug/100cm ²	0.00005	0.00009	0.00007	0.00002

Room 112B Floor

Measurement	N	Units	Min ^a	Max	Mean	Std Dev
Beta	259	dpm/100cm ²	-148.0	403928.0	19779.1	42459.0
Alpha	68	dpm/100cm ²	119.0	22284.0	1800.3	3154.2
Removable Beta	51	dpm/100cm ²	15.0	275.0	95.5	51.9
Removable Alpha	51	dpm/100cm ²	6.0	165.0	57.1	34.6
Beryllium	51	ug/100cm ²	0.00005	0.00200	0.00074	0.00066

^a Negative numbers designate readings below background.

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Table E-4, B883 ORNL Summary Statistics, Survey Areas A-F

Room 112B Lower Walls

Measurement	N	Units	Min ^a	Max	Mean	Std Dev
Beta	117	dpm/100cm ²	-395.0	24841.0	1354.2	3678.9
Removable Beta	23	dpm/100cm ²	16.0	310.0	89.0	71.7
Removable Alpha	23	dpm/100cm ²	3.0	586.0	66.2	116.4
Beryllium	23	ug/100cm ²	0.00005	0.00022	0.00006	0.00003

Room 138C Floor

Measurement	N	Units	Min ^a	Max	Mean	Std Dev
Beta	345	dpm/100cm ²	127.0	434280.0	11277.6	36242.9
Alpha	40	dpm/100cm ²	161.0	17668.0	3018.8	4386.7
Removable Beta	69	dpm/100cm ²	25.0	660.0	111.9	88.0
Removable Alpha	69	dpm/100cm ²	6.0	359.0	58.2	50.3
Beryllium	68	ug/100cm ²	0.00005	0.00230	0.00011	0.00027

Room 138C Lower Walls

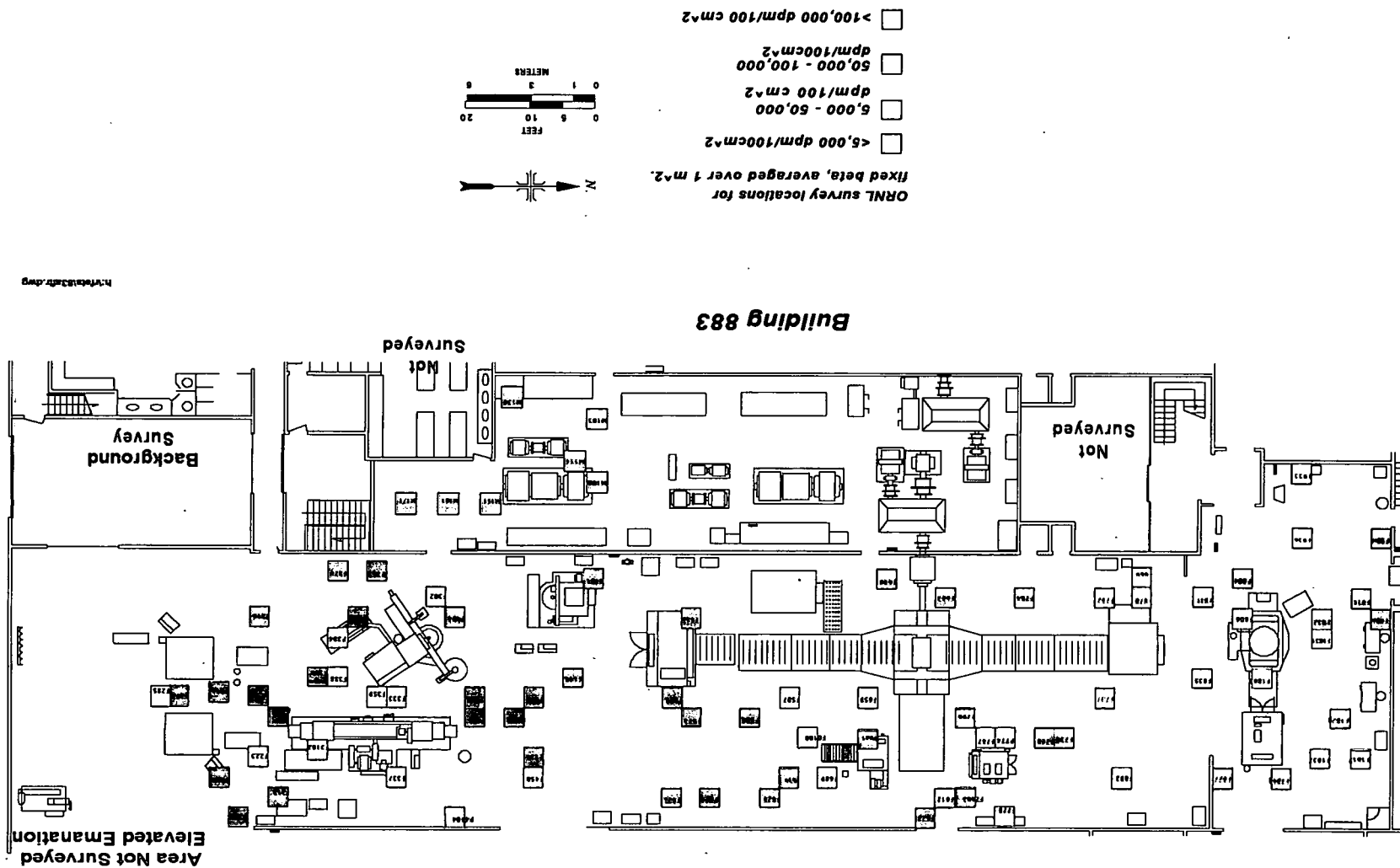
Measurement	N	Units	Min ^a	Max	Mean	Std Dev
Beta	17	dpm/100cm ²	-114.0	1022.0	244.0	343.1
Alpha	3	dpm/100cm ²	16.0	383.0	232.3	156.8
Removable Beta	21	dpm/100cm ²	15.0	127.0	51.8	31.9
Removable Alpha	21	dpm/100cm ²	3.0	85.0	26.0	21.3
Beryllium	21	ug/100cm ²	0.00005	0.00005	0.00005	0.00000

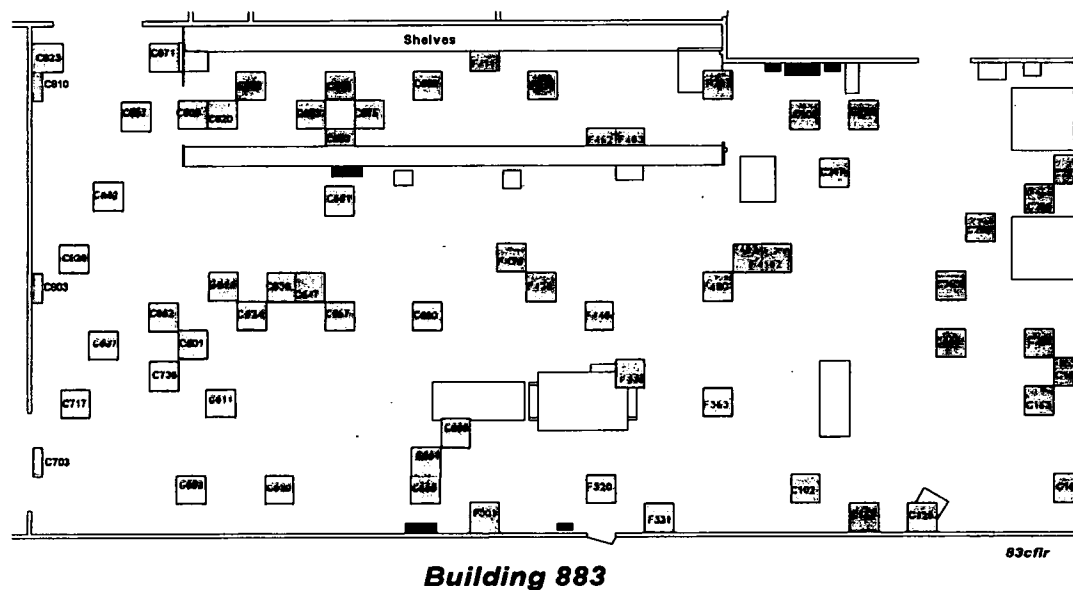
^a Negative numbers designate readings below background.

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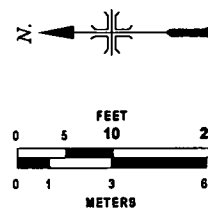
Detail average fixed beta measurements for A-side and machine room floors, Building 883.





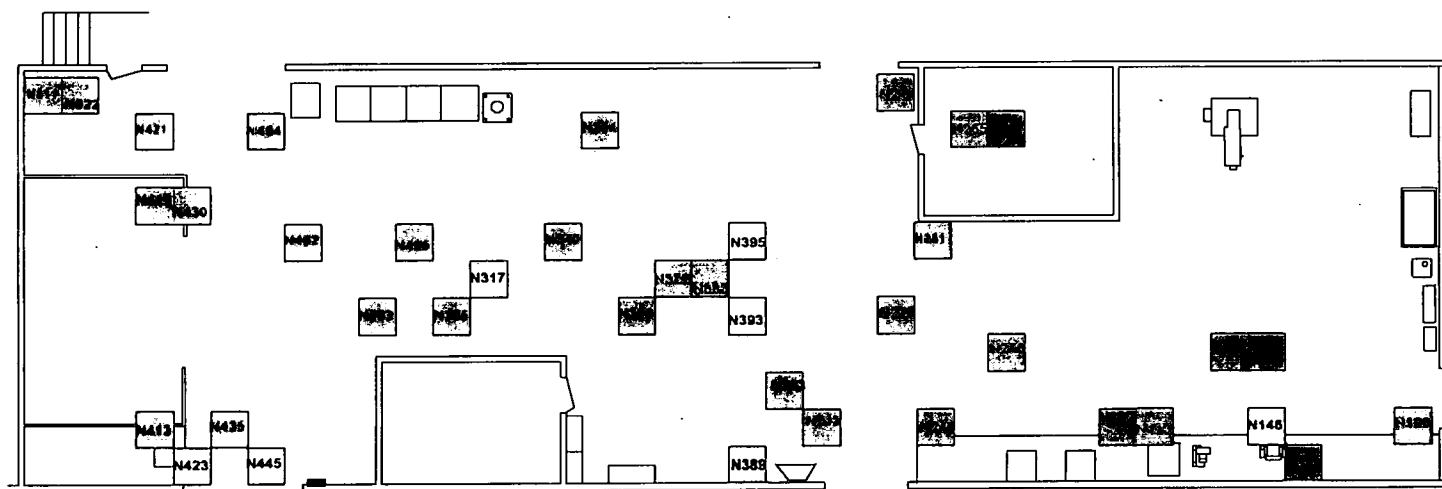
ORNL survey locations for
fixed beta, averaged over 1 m².

- ☐ <5,000 dpm/100cm²
- ☐ 5,000 - 50,000
dpm/100 cm²
- ☐ 50,000 - 100,000
dpm/100cm²
- ☐ >100,000 dpm/100 cm²



Detail average fixed beta measurements for North Annex floors, Building 883 equipment surveyed, Building 883.

79
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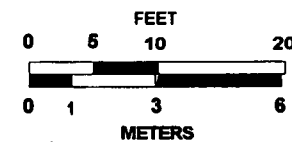
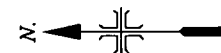


Building 883

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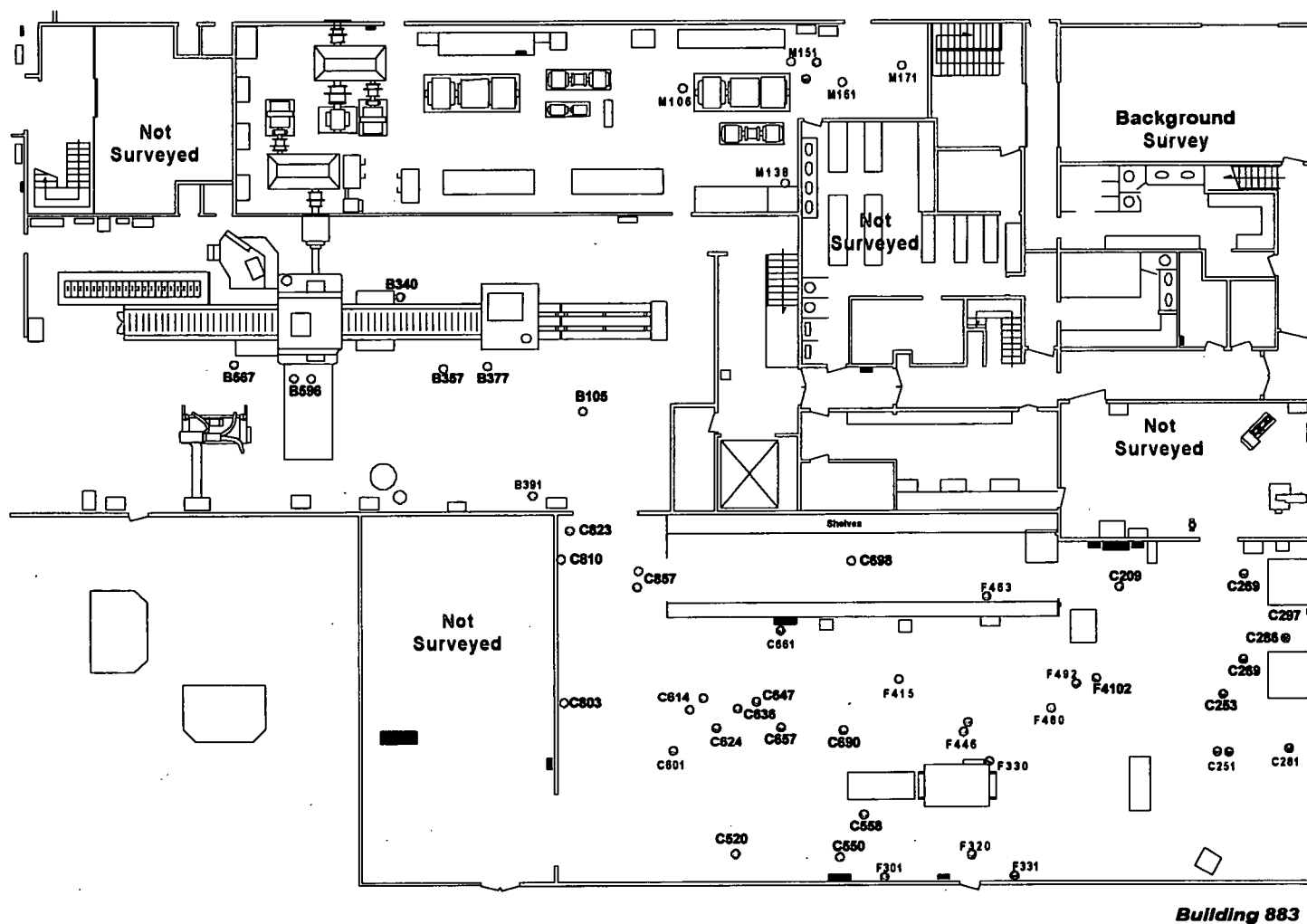
**ORNL survey locations for
fixed beta, averaged over 1 m².**

- ☐ <5,000 dpm/100cm²
- ☐ 5,000 - 50,000
dpm/100 cm²
- ☐ 50,000 - 100,000
dpm/100cm²
- ☐ >100,000 dpm/100 cm²

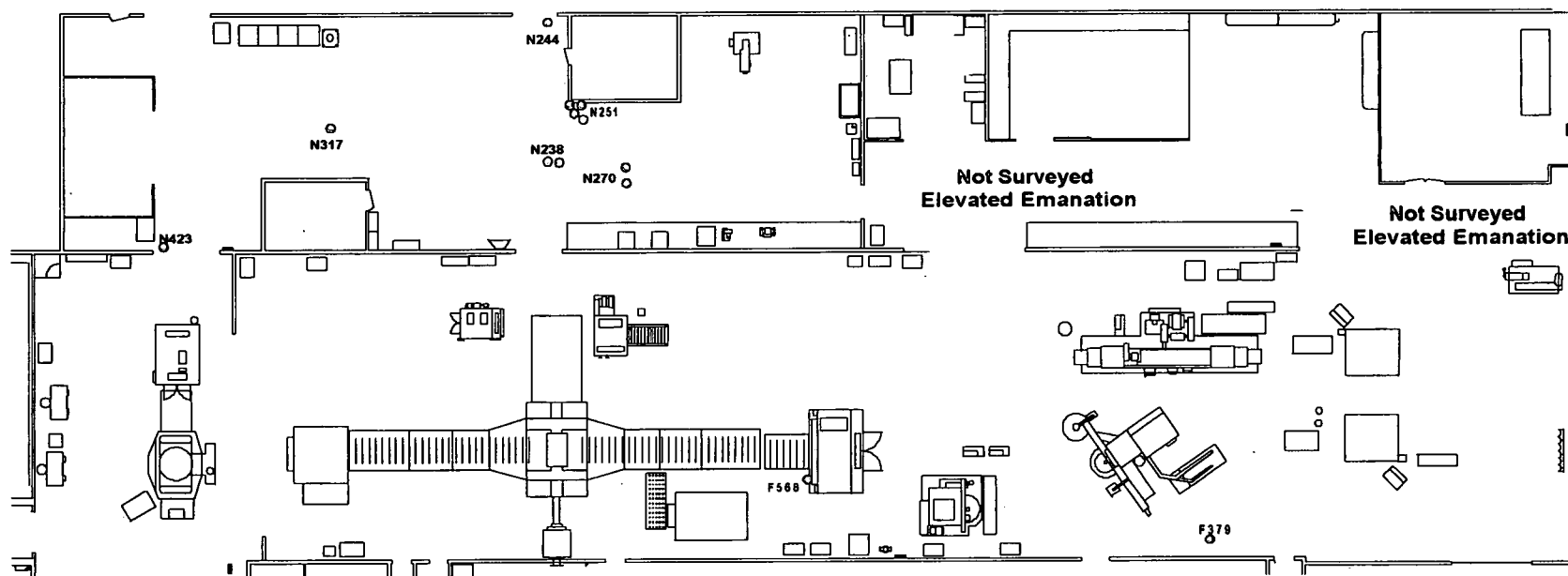


Detail average fixed beta measurements for C-side room floors, Building 883.

83



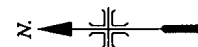
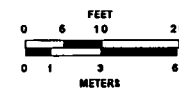
Biased measurement locations, Building 883, west side.



Building 883

**ORNL survey locations for
biased beta measurements**

- <5,000 dpm/100cm²
- 5,000 - 50,000
dpm/100 cm²
- 50,000 - 100,000
dpm/100cm²
- >100,000 dpm/100 cm²



Rocky Flats

Biased measurement locations, Building 883, east side.

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82

ATTACHMENT E-2

B883 Fixed Contamination Log and Semi- Annual Surveys

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COPY

B-883 FIXED CONTAMINATION LOG							
ID #	ROOM #	SPECIFIC LOCATION	DATE INITIATED	ALPHA DPM/100CM2	BETA DPM/100CM2	DATE REMOVED	REMOVAL CODE
883-1	141	in sink, near drain	7/11/95	<52	19,120		
883-2	141	on floor - in front of drain	N/A	N/A	N/A	12/5/99	2
883-3	141	on floor - by cabinet	N/A	N/A	N/A	12/5/99	2
883-4	112	on floor - in partitioned area	7/11/95	138	5224		
883-5	112	on floor - in partitioned area-under tape	7/11/95	198	74,880		
883-6	112	on floor - in partitioned area-under tape	7/11/95	552	38,160		
883-7	112	on floor - in partitioned area-under tape	7/11/95	330	74,160		
883-8	112	on floor - in partitioned area-under tape	7/11/95	294	20,949		
883-9	112	on floor - in partitioned area-under tape	7/11/95	726	77,040		
883-10	112	on floor - in partitioned area-under tape	7/11/95	678	13,104		
883-11	112	on floor - in partitioned area-(UNDER TAPE)	7/11/95	1992	73,440	6/15/01	2,3
883-12	112	on floor - in partitioned area-under tape	7/11/95	102	66,600		
883-13	112	on floor - in partitioned area-under tape	7/11/95	408	26,115		
883-14	112	on floor - in partitioned area-under tape	7/11/95	3516	262,800		
883-15	112	on floor - in partitioned area-under tape	7/11/95	606	47,520		
883-16	112	on floor - in partitioned area-under tape	7/11/95	1044	203,400		
883-17	112	on metal plate, under ladder	5/10/95	84	25,164		
883-18	112	on metal plate, under ladder	5/10/95	606	8521		
883-19	112	on metal plate, under ladder	5/10/95	84	7668		
883-20	112	on floor - by CA -under tape	5/10/95	120	8287		
883-21	112	on floor - at top of stairs	5/10/95	1554	35,784		
883-22	112	on floor - at right of elevator-in corner	5/10/95	210	17,579		
883-23	112	on wall - at left of elevator	5/10/95			12/5/99	2
883-24	112	on wall - at left of elevator	5/10/95			12/5/99	2
883-25	112	on wall - at left of elevator	5/10/95			12/5/99	2
883-26	112	at base of column C-3	5/10/95				
883-27	111	on floor - main walkway	8/14/97	126	11,380		
883-28	111	on floor - SW corner	8/14/97	618	56,160		
883-29	111	on floor - near door to RM 112	8/14/97	204	20,218		

Removal codes:

1. Item meets the definition for Radioactive Material and not a Fixed Contamination Area.
2. Area no longer meets the criteria for a Fixed Contamination Area.
3. Area meets the requirements for a Potential Internal Contamination label and not a Fixed Contamination Area.
4. Fixed Contamination label was redundant in an area already labeled.

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COPY

B-883 FIXED CONTAMINATION LOG

ID #	ROOM #	SPECIFIC LOCATION	DATE INITIATED	ALPHA DPM/100CM2	BETA DPM/100CM2	DATE REMOVED	REMOVAL CODE
883-30	111	on floor - cracks in floor plates by gensets	8/14/97	240	52,920		
883-31	111	on floor - middle of room	8/14/97	72	8925		
883-32	111	on floor - by door to RM 105-cracks	8/14/97	474	374,400		
883-33	111	on floor - NW corner-cracks	8/14/97	186	126,360		
883-34	111	on floor - north end of room	8/14/97	132	63,720		
883-35	111	on floor - near center of north end of room	8/14/97	942	24,466		
883-36							
883-37							
883-38							
883-39							
883-40							
883-41							
883-42							
883-43							
883-44							
883-45							
883-46							
883-47							
883-48							
883-49							
883-50							
883-51							
883-52							
883-53							
883-54							
883-55							
883-56							
883-57							
883-58							

Removal codes:

1. Item meets the definition for Radioactive Material and not a Fixed Contamination Area.
2. Area no longer meets the criteria for a Fixed Contamination Area.
3. Area meets the requirements for a Potential Internal Contamination label and not a Fixed Contamination Area.
4. Fixed Contamination label was redundant in an area already labeled.

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.: EBERLINE	Mfg.: NE	Mfg.: N/A	Survey Type: 883-1SA-FIXED CONTAMINATION
Model SAC-4	Model ELECTRA	Model N/A	Building: 883
Serial # 961	Serial # 1390	Serial # N/A	Location: Various
Cal Due 11/1/01	Cal Due 11/21/01	Cal Due N/A	Purpose: Semi-annual routine survey
Bkg. .2 cpm α	Bkg. 3 cpm α	Bkg. N/A	RWP #: N/A
Eff. 33.00%	Eff. 20.7 %	Eff. N/A	
MDA 20 dpm α	MDA 52 dpm α	MDA N/A	

Mfg.: EBERLINE	Mfg.: NE	Mfg.: N/A	Date: 6/15/01	Time: 13:00
Model BC-4	Model ELECTRA	Model N/A		
Serial # 868	Serial # 1390	Serial # N/A		
Cal Due 7/12/01	Cal Due 11/21/01	Cal Due N/A		
Bkg. 40.5 cpm α	Bkg. 682 cpm β	Bkg. N/A		
Eff. 25.00%	Eff. 31.00%	Eff. N/A		
MDA 200 dpm β	MDA 400 dpm β	MDA N/A		
			RCT NAME	SIGNATURE
			N/A	N/A
			RCT NAME	SIGNATURE
			N/A	N/A

PRN/REN #: N/A

Comments: SEE FCA LOG FOR ADDITIONAL INFORMATION. ISOTOPE OF CONCERN IS DU. TAG THAT WAS REMOVED WAS REPLACED WITH AN INTERNAL CONTAMINATION TAG.

SURVEY RESULTS

ROOM	LOCATION / DATE	YEAR	ORIGINAL FIXED ACTIVITY		PRESENT FIXED ACTIVITY		LOOSE CONTAMINATION		TAG
			ALPHA	BETA	ALPHA	BETA	ALPHA	BETA	
#	STICKER ID #		DPM/100CM2	DPM/100CM2	DPM/100CM2	DPM/100CM2	DPM/100CM2	DPM/100CM2	STATUS
141	883-1	1995	<65	18,500	<52	19,120	<20	<200	retagged
112	883-4	1995	198	18,940	138	5224	<20	<200	retagged
112	883-5	1995	104	66,290	198	74,880	<20	<200	retagged
112	883-6	1995	<46	44,700	552	38,160	<20	<200	retagged
112	883-7	1995	246	94,700	330	74,160	<20	<200	retagged
112	883-8	1995	276	20,106	294	20,949	<20	<200	retagged
112	883-9	1995	1140	60,990	726	77,040	<20	<200	retagged
112	883-10	1995	666	12,715	678	13,104	<20	<200	retagged
112	883-11	1995	798	56,820	1992	73,440	95	250	removed
112	883-12	1995	1092	56,820	102	66,600	<20	<200	retagged
112	883-13	1995	N/A	8940	408	26,115	<20	<200	retagged
112	883-14	1995	3778	270,360	3516	262,800	<20	<200	retagged
112	883-15	1995	522	142,050	606	47,520	<20	<200	retagged
112	883-16	1995	11026	378,800	1044	203,400	<20	<200	retagged
112	883-17	1995	468	28,125	84	25,164	<20	<200	retagged
112	883-18	1995	1240	14,062	606	8521	<20	<200	retagged
112	883-19	1995	1010	9375	84	7668	<20	<200	retagged

Date Reviewed: 6/22/01 RS Supervisor

ATION / DATE
ID # YEAR

ATTACHMENT E-3

B883 Trenches, Sumps, Pits and B879 (Interior)

Survey Reports and Maps

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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

lfg.	Ludlum	Mfg.	NE Electra	Mfg.	NE Electra	Survey Type:	Contamination
Model	SAC-4	Model	DP-6	Model	DP-6	Building:	883
Serial #	823	Serial #	3107	Serial #	1513	Location:	Pits, Sumps, & Trenches
Cal Due	11/2/01	Cal Due	9/28/01	Cal Due	9/29/01	Purpose:	883 RLC Survey
Bkg	0.1 cpm α	Bkg	6 cpm α	Bkg	2 cpm α	RWP #:	01-881-0021
Efficiency	33.00 %	Efficiency	22.00 %	Efficiency	21.07	Date:	8/27/01
MDA	12 dpm α	MDA	64 dpm α	MDA	44 dpm α	Time:	1300
lfg.	Ludlum	Mfg.	NE Electra	Mfg.	NE Electra		
Model	BC-4	Model	DP-6	Model	DP-6		
Serial #	775	Serial #	3107	Serial #	1513		
Cal Due	12/1/01	Cal Due	9/28/01	Cal Due	9/29/01		
Bkg	40.2 cpm β	Bkg	599 cpm β	Bkg	309 cpm β		
Efficiency	25.00 %	Efficiency	32.30 %	Efficiency	32.04		
MDA	103 dpm β	MDA	361 dpm β	MDA	264 dpm β		

RN/REN #: N/A

Comments: ISOTOPE OF CONCERN IS PU AND DU.

SURVEY RESULTS

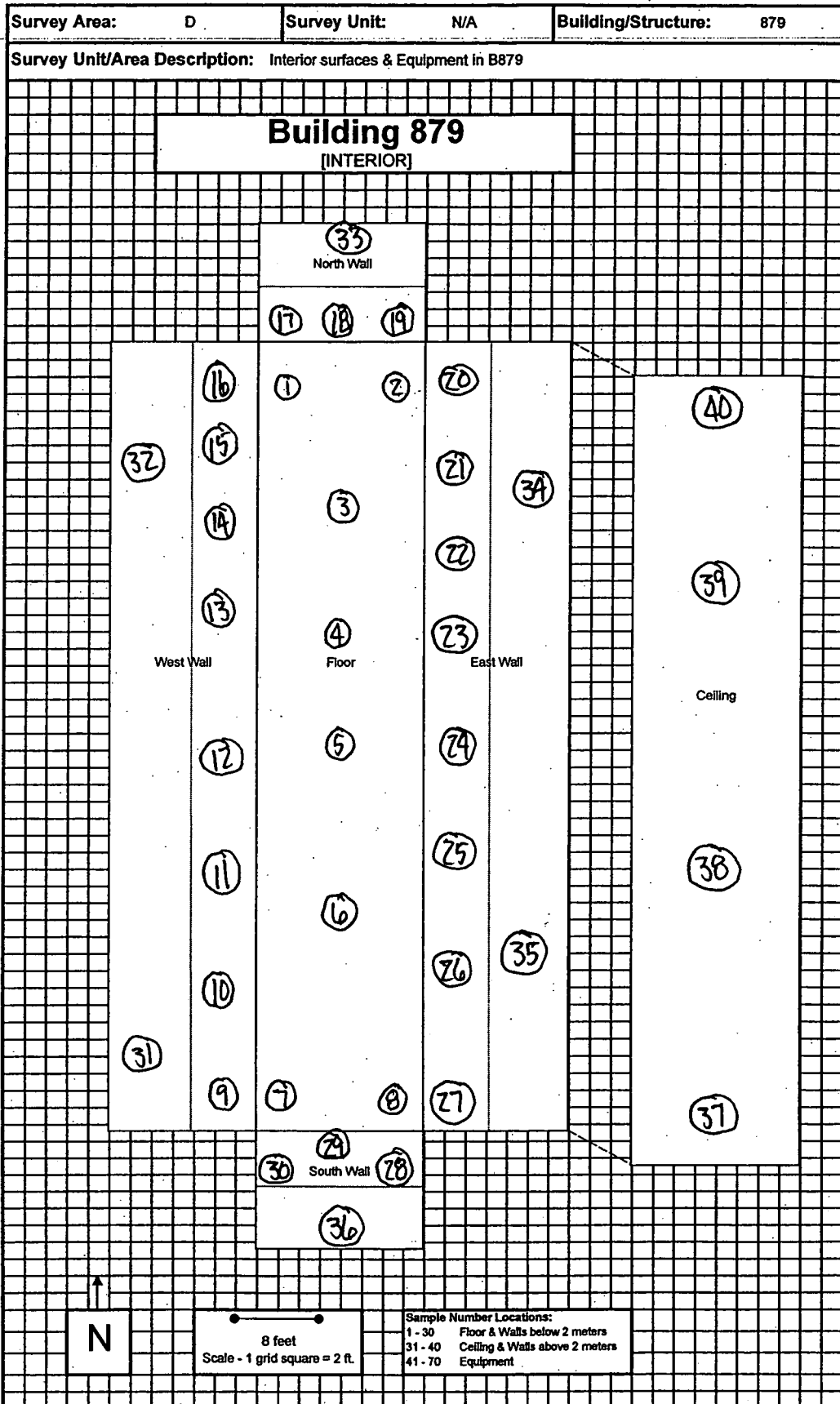
Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Total		Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Total	
		Alpha	Beta	Alpha	Beta			Alpha	Beta	Alpha	Beta
1	Room 138 East Trench	0	0	732	52944	26	Room 109 South	91	3839	NA	NA
2	Room 138 East Trench	0	0	NA	NA	27	Room 104	60	3839	964	6.E+05
3	Room 138 North Trench	12	51	809	36474	28	Room 104	60	3839	NA	NA
4	Room 138 North Trench	30	39	NA	NA	29	Room 104 scale	485	11839	295	4.6E+05
5	Room 138 South Trench	51	163	500	22167	30	Room 104 scale	121	3839	NA	NA
6	Room 138 South Trench	36	95	NA	NA	31	Room 104	60	7839	209	2.2E+05
7	Room 139 Pit	45	287	291	81737	32	Room 104	54	3839	NA	NA
8	Room 139 Pit	57	187	NA	NA	33	100 ton press room 105	606	39839	700	7.3E+05
9	Room 139 Trench	42	231	50	7266	34	100 ton press room 105	624	45839	1837	2.8E+06
10	Room 139 Trench	33	187	NA	NA	35	300 ton press room 105	266	29039	818	4.0E+05
11	Pit west of B Mill	909	99839	6791	4.6E+06	36	300 ton press room 105	45	25839	228	1.2E+06
12	Pit west of B Mill	866	71839	NA	NA	37	Room 105 F4/F5	182	19839	1936	1.5E+06
13	Pit North of B Mill	63	3839	982	5.E+05	38	Room 105 F4/F5	272	23839	NA	NA
14	Pit North of B Mill	75	9039	123	2.4E+05	39	Room 105 South of B Roller	91	3839	4655	592573
15	Pit for B HPM press	66	5839	114	15529	40	Room 105 South of B Roller	78	7839	NA	NA
16	Pit for B HPM press	45	3263	NA	NA	41	Room 105 West of B Roller	2878	3999839	3095	6094121
17	Pit for A HPM press	48	3839	1164	2.2E+05	42	Room 105 West of B Roller	1848	330239	7110	2433493
18	Pit for A HPM press	42	2863	NA	NA	43	Room 105 North of B Roller	336	83439	1791	1236536
19	Pit between A & Erie press	242	29839	200	2.4E+05	44	Room 105 North of B Roller	242	151839	NA	NA
20	Pit between A & Erie press	363	32264	NA	NA	45	Basement Room 1	54	1839	3645	772139
21	South of Erie press	206	43839	600	1.2E+06	46	Basement Room 1	60	2639	NA	NA
22	South of Erie press	212	15839	NA	NA	47	Room 139 North Tank	1078	21439	3518	2858827
23	Room 109 lip of pit	375	15839	255	1.5E+06	48	Room 139 North Tank	636	11839	NA	NA
24	Room 109 pit	363	1439	171	4.7E+05	49	Room 139 South tank	2151	27439	1591	2227248
25	Room 109 South	60	27839	3064		50	Room 139 South tank	2639	51039	NA	NA

Date Reviewed: 9-12-01 RS Supervision:

ROCKY PLATS ENVIRONMENTAL TECHNOLOGY SITE

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Total		Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Total	
		Alpha	Beta	Alpha	Beta			Alpha	Beta	Alpha	Beta
51	Elevator Pit	45	2183	32	932	102	NA	NA	NA	NA	NA
52	Door to Elevator Pit	54	2847	788	8939	103	NA	NA	NA	NA	NA
53	Room 138 B Manhole Cover	3	19	141	35297	104	NA	NA	NA	NA	NA
54	Room 138 B I/S Manhole	3	499	109	6442	105	NA	NA	NA	NA	NA
55	Room 138 B I/S Manhole	3	679	NA	NA	106	NA	NA	NA	NA	NA
56	A HPM Press Pit	103	1403	636	60209	107	NA	NA	NA	NA	NA
57	A HPM Press Pit	51	8959	NA	NA	108	NA	NA	NA	NA	NA
58	B HPM Press Pit	145	2239	342	11592	109	NA	NA	NA	NA	NA
59	B HPM Press Pit	85	1123	NA	NA	110	NA	NA	NA	NA	NA
60	Room 102 Floor	24	0	313	79248	111	NA	NA	NA	NA	NA
61	Room 102 Floor	78	139	859	51087	112	NA	NA	NA	NA	NA
62	Room 102 Floor	54	227	NA	NA	113	NA	NA	NA	NA	NA
63	Room 102 Floor	57	259	NA	NA	114	NA	NA	NA	NA	NA
64	Room 102 Floor	36	79	NA	NA	115	NA	NA	NA	NA	NA
65	Room 102 Floor	66	211	NA	NA	116	NA	NA	NA	NA	NA
66	Room 138 Scale	75	399	788	21227	117	NA	NA	NA	NA	NA
67	Room 138 Scale	227	1279	NA	NA	118	NA	NA	NA	NA	NA
68	NA	NA	NA	NA	NA	119	NA	NA	NA	NA	NA
69	NA	NA	NA	NA	NA	120	NA	NA	NA	NA	NA
70	NA	NA	NA	NA	NA	121	NA	NA	NA	NA	NA
71	NA	NA	NA	NA	NA	122	NA	NA	NA	NA	NA
72	NA	NA	NA	NA	NA	123	NA	NA	NA	NA	NA
73	NA	NA	NA	NA	NA	124	NA	NA	NA	NA	NA
74	NA	NA	NA	NA	NA	125	NA	NA	NA	NA	NA
75	NA	NA	NA	NA	NA	126	NA	NA	NA	NA	NA
76	NA	NA	NA	NA	NA	127	NA	NA	NA	NA	NA
77	NA	NA	NA	NA	NA	128	NA	NA	NA	NA	NA
78	NA	NA	NA	NA	NA	129	NA	NA	NA	NA	NA
79	NA	NA	NA	NA	NA	130	NA	NA	NA	NA	NA
80	NA	NA	NA	NA	NA	131	NA	NA	NA	NA	NA
81	NA	NA	NA	NA	NA	132	NA	NA	NA	NA	NA
82	NA	NA	NA	NA	NA	133	NA	NA	NA	NA	NA
83	NA	NA	NA	NA	NA	134	NA	NA	NA	NA	NA
84	NA	NA	NA	NA	NA	135	NA	NA	NA	NA	NA
85	NA	NA	NA	NA	NA	136	NA	NA	NA	NA	NA
86	NA	NA	NA	NA	NA	137	NA	NA	NA	NA	NA
87	NA	NA	NA	NA	NA	138	NA	NA	NA	NA	NA
88	NA	NA	NA	NA	NA	139	NA	NA	NA	NA	NA
89	NA	NA	NA	NA	NA	140	NA	NA	NA	NA	NA
90	NA	NA	NA	NA	NA	141	NA	NA	NA	NA	NA
91	NA	NA	NA	NA	NA	142	NA	NA	NA	NA	NA
92	NA	NA	NA	NA	NA	143	NA	NA	NA	NA	NA
93	NA	NA	NA	NA	NA	144	NA	NA	NA	NA	NA
94	NA	NA	NA	NA	NA	145	NA	NA	NA	NA	NA
95	NA	NA	NA	NA	NA	146	NA	NA	NA	NA	NA
96	NA	NA	NA	NA	NA	147	NA	NA	NA	NA	NA
97	NA	NA	NA	NA	NA	148	NA	NA	NA	NA	NA
98	NA	NA	NA	NA	NA	149	NA	NA	NA	NA	NA
99	NA	NA	NA	NA	NA	150	NA	NA	NA	NA	NA
100	NA	NA	NA	NA	NA	151	NA	NA	NA	NA	NA
101	NA	NA	NA	NA	NA	152	NA	NA	NA	NA	NA



96
93

ROCKY MOUNTAIN ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	NE Electra	Mfg.	NE Electra
Model	SAC-4	Model	DP-6	Model	DP-6
Serial #	1158	Serial #	1366	Serial #	1682
Cal Due	11/1/01	Cal Due	7/22/01	Cal Due	7/22/01
Bkg	0.6 cpm α	Bkg	5 cpm α	Bkg	1 cpm α
Efficiency	33.00 %	Efficiency	20.80 %	Efficiency	22.00 %
MDA	20 dpm α	MDA	63 dpm α	MDA	33 dpm α

Survey Type: Contamination

Building: 879

Location: Floor, ceiling, walls and equipment

Purpose: RLC Survey

RWP #: N/A

Date: 6/28/01

Time: 14:00

Mfg.	Eberline	Mfg.	NE Electra	Mfg.	NE Electra
Model	BC-4	Model	DP-6	Model	DP-6
Serial #	842	Serial #	1366	Serial #	1682
Cal Due	12/28/01	Cal Due	7/22/01	Cal Due	7/22/01
Bkg	44.4 cpm β	Bkg	655 cpm β	Bkg	524 cpm β
Efficiency	25.00 %	Efficiency	32.30 %	Efficiency	30.20 %
MDA	200 dpm β	MDA	377 dpm β	MDA	361 dpm β

PRN/REN #: N/A

Comments: 0 = Less than or equal to zero

1 meter scans on points 1 - 40, no elevated levels detected

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Direct	
		Alpha	Beta	Alpha	Beta
1	Floor	0	0	14	923
2	Floor	4	0	32	0
3	Floor	0	0	0	749
4	Floor	1	0	18	0
5	Floor	0	0	0	796
6	Floor	0	0	23	0
7	Floor	0	0	10	669
8	Floor	4	0	9	0
9	West Wall	0	0	10	0
10	West Wall	1	0	0	0
11	West Wall	0	0	0	0
12	West Wall	0	0	23	0
13	West Wall	0	0	0	0
14	West Wall	0	0	0	0
15	West Wall	0	14	0	0
16	West Wall	0	0	0	0
17	North Wall	0	0	53	0
18	North Wall	0	0	77	0
19	North Wall	0	0	29	0
20	East Wall	0	0	23	0
21	East Wall	0	2	10	0
22	East Wall	0	18	0	0
23	East Wall	0	0	5	0
24	East Wall	0	0	0	0
25	East Wall	0	0	24	0

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Direct	
		Alpha	Beta	Alpha	Beta
26	East Wall	0	18	0	0
27	East Wall	0	0	0	495
28	South Wall	4	0	0	0
29	South Wall	1	0	29	625
30	South Wall	4	204	0	0
31	West Wall >2m	0	0	34	848
32	West Wall >2m	4	2	0	0
33	North Wall > 2m	0	0	0	598
34	East Wall >2m	1	0	0	0
35	East Wall >2m	0	0	14	0
36	South Wall >2m	1	6	0	0
37	Ceiling	4	50	10	0
38	Ceiling	4	0	0	0
39	Ceiling	1	0	0	0
40	Ceiling	0	0	0	0
41	North Exh. Fan	0	0	38	0
42	Panel Front	0	0	0	0
43	North Ex. Fan	1	0	0	0
44	Panel Front	0	18	0	0
45	Panel North	0	0	0	0
46	Filter Bank	0	10	0	0
47	"B" Exh. Duct	0	0	5	0
48	"B" Exh. Hatch	0	0	0	0
49	Cart 4 Wheel	4	0	0	0
50	"B" Exh. Fan Belt Coyer	0	0	0	0

Date Reviewed: 7-11-01

RS Supervision:

Print Name

Signature

Emp. #

ROCKY PLATES ENVIRONMENTAL TECHNOLOGY SITE

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Direct	
		Alpha	Beta	Alpha	Beta
51	"B" Exh. Fan Motor	0	0	34	0
52	"B" Exh. Fan Discharge	0	0	0	0
53	"B" Suction Boot	0	0	0	0
54	"B" Exh. Panel	0	0	0	0
55	"A" Exh. Panel	1	0	0	0
56	83JB E 1,2 Junction Box	0	0	0	0
57	"A" Suction Pipe	4	0	0	0
58	"A" Exh. Door	0	0	0	0
59	"A" Exh. Fan Belt Cover	0	30	0	0
60	"A" Exh. Piping	1	0	0	0
61	"A" Exh. Fan Motor	1	0	0	0
62	"A" Exh. Piping	1	0	0	0
63	"A" Suction Boot	0	0	0	0
64	South Side of Panel	0	0	0	0
65	West Side of Panel	1	0	0	0
66	"A" Panel	0	0	0	0
67	Vent	0	0	5	0
68	Side	0	0	0	0
69	Light Switch	1	0	0	0
70	Disconnect EF-3	1	0	0	0
71	NA	NA	NA	NA	NA
72	NA	NA	NA	NA	NA
73	NA	NA	NA	NA	NA
74	NA	NA	NA	NA	NA
75	NA	NA	NA	NA	NA
76	NA	NA	NA	NA	NA
77	NA	NA	NA	NA	NA
78	NA	NA	NA	NA	NA
79	NA	NA	NA	NA	NA
80	NA	NA	NA	NA	NA
81	NA	NA	NA	NA	NA
82	NA	NA	NA	NA	NA
83	NA	NA	NA	NA	NA
84	NA	NA	NA	NA	NA
85	NA	NA	NA	NA	NA
86	NA	NA	NA	NA	NA
87	NA	NA	NA	NA	NA
88	NA	NA	NA	NA	NA
89	NA	NA	NA	NA	NA
90	NA	NA	NA	NA	NA
91	NA	NA	NA	NA	NA
92	NA	NA	NA	NA	NA
93	NA	NA	NA	NA	NA
94	NA	NA	NA	NA	NA
95	NA	NA	NA	NA	NA
96	NA	NA	NA	NA	NA
97	NA	NA	NA	NA	NA
98	NA	NA	NA	NA	NA
99	NA	NA	NA	NA	NA
100	NA	NA	NA	NA	NA
101	NA	NA	NA	NA	NA

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Direct	
		Alpha	Beta	Alpha	Beta
102	NA	NA	NA	NA	NA
103	NA	NA	NA	NA	NA
104	NA	NA	NA	NA	NA
105	NA	NA	NA	NA	NA
106	NA	NA	NA	NA	NA
107	NA	NA	NA	NA	NA
108	NA	NA	NA	NA	NA
109	NA	NA	NA	NA	NA
110	NA	NA	NA	NA	NA
111	NA	NA	NA	NA	NA
112	NA	NA	NA	NA	NA
113	NA	NA	NA	NA	NA
114	NA	NA	NA	NA	NA
115	NA	NA	NA	NA	NA
116	NA	NA	NA	NA	NA
117	NA	NA	NA	NA	NA
118	NA	NA	NA	NA	NA
119	NA	NA	NA	NA	NA
120	NA	NA	NA	NA	NA
121	NA	NA	NA	NA	NA
122	NA	NA	NA	NA	NA
123	NA	NA	NA	NA	NA
124	NA	NA	NA	NA	NA
125	NA	NA	NA	NA	NA
126	NA	NA	NA	NA	NA
127	NA	NA	NA	NA	NA
128	NA	NA	NA	NA	NA
129	NA	NA	NA	NA	NA
130	NA	NA	NA	NA	NA
131	NA	NA	NA	NA	NA
132	NA	NA	NA	NA	NA
133	NA	NA	NA	NA	NA
134	NA	NA	NA	NA	NA
135	NA	NA	NA	NA	NA
136	NA	NA	NA	NA	NA
137	NA	NA	NA	NA	NA
138	NA	NA	NA	NA	NA
139	NA	NA	NA	NA	NA
140	NA	NA	NA	NA	NA
141	NA	NA	NA	NA	NA
142	NA	NA	NA	NA	NA
143	NA	NA	NA	NA	NA
144	NA	NA	NA	NA	NA
145	NA	NA	NA	NA	NA
146	NA	NA	NA	NA	NA
147	NA	NA	NA	NA	NA
148	NA	NA	NA	NA	NA
149	NA	NA	NA	NA	NA
150	NA	NA	NA	NA	NA
151	NA	NA	NA	NA	NA
152	NA	NA	NA	NA	NA

ATTACHMENT E-4

883 Cluster Exterior Survey Data Summaries and Maps

(B883 & B879)

99
9/16

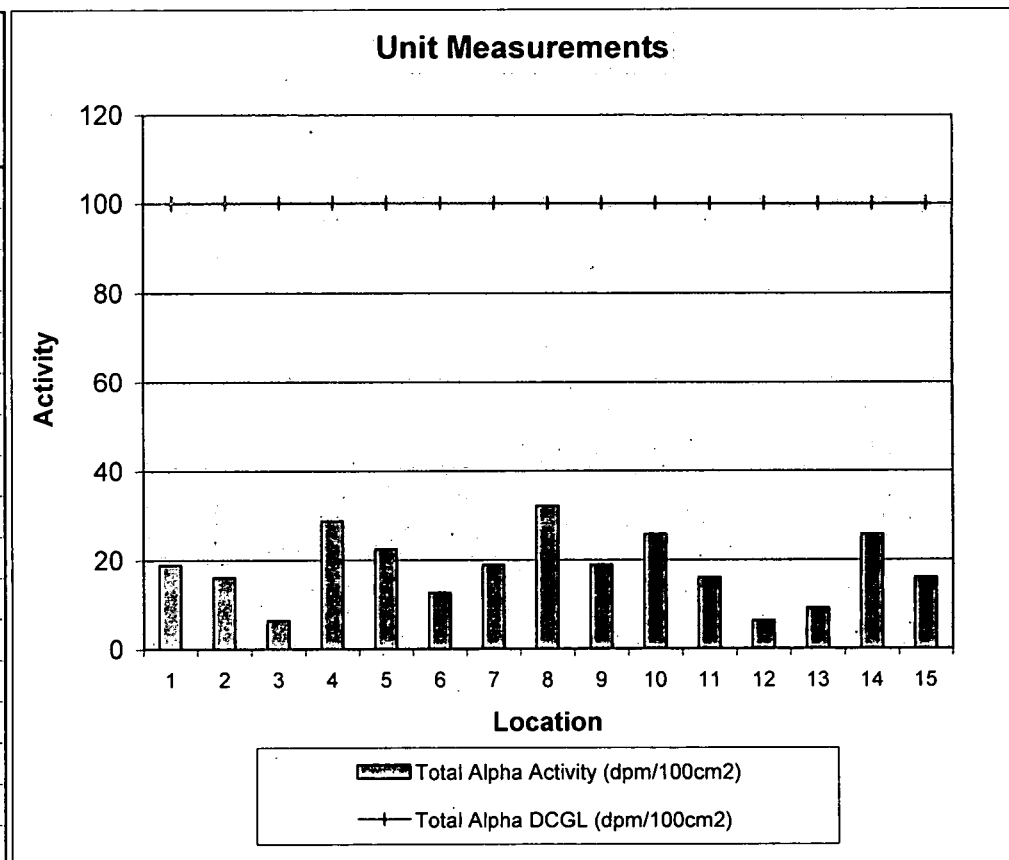
TSA Alpha

883001

7/10/01

				Instrument	<u>392</u>	<u>1420</u> QA Instrument
standard deviation:	7.8	max:	32.1	Ave. Instrument background:	1.4 cpm	1.3 cpm
mean:	18.2	min:	6.2	Instrument efficiency:	20.5%	21.95%
median:	18.9			Instrument MDA:	48 dpm	48 dpm

	Surface Location	Total Alpha Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Alpha Activity (dpm/100cm ²)	Total Alpha DCGL (dpm/100cm ²)
1	883 E. Roof	5.3	2.0	18.9	100
2	883 E. Roof	4.7	0.7	16.0	100
3	883 E. Roof	2.7	1.3	6.2	100
4	883 E. Roof	7.3	2.7	28.7	100
5	883 E. Roof	6.0	2.0	22.3	100
6	883 E. Roof	4.0	1.3	12.6	100
7	883 E. Roof	5.3	0.7	18.9	100
8	883 E. Roof	8.0	0.7	32.1	100
9	883 E. Roof	5.3	1.3	18.9	100
10	883 E. Roof	6.7	1.3	25.8	100
11	883 E. Roof	4.7	2.7	16.0	100
12	883 E. Roof	2.7	1.3	6.2	100
13	883 E. Roof	3.3	0.7	9.2	100
14	883 E. Roof	6.7	1.3	25.8	100
15	883 E. Roof	4.7	1.3	16.0	100
1 QC	883 E. Roof	5.3	1.3	18.2	100
2 QC	883 E. Roof	4.7	1.3	15.5	100



97
100

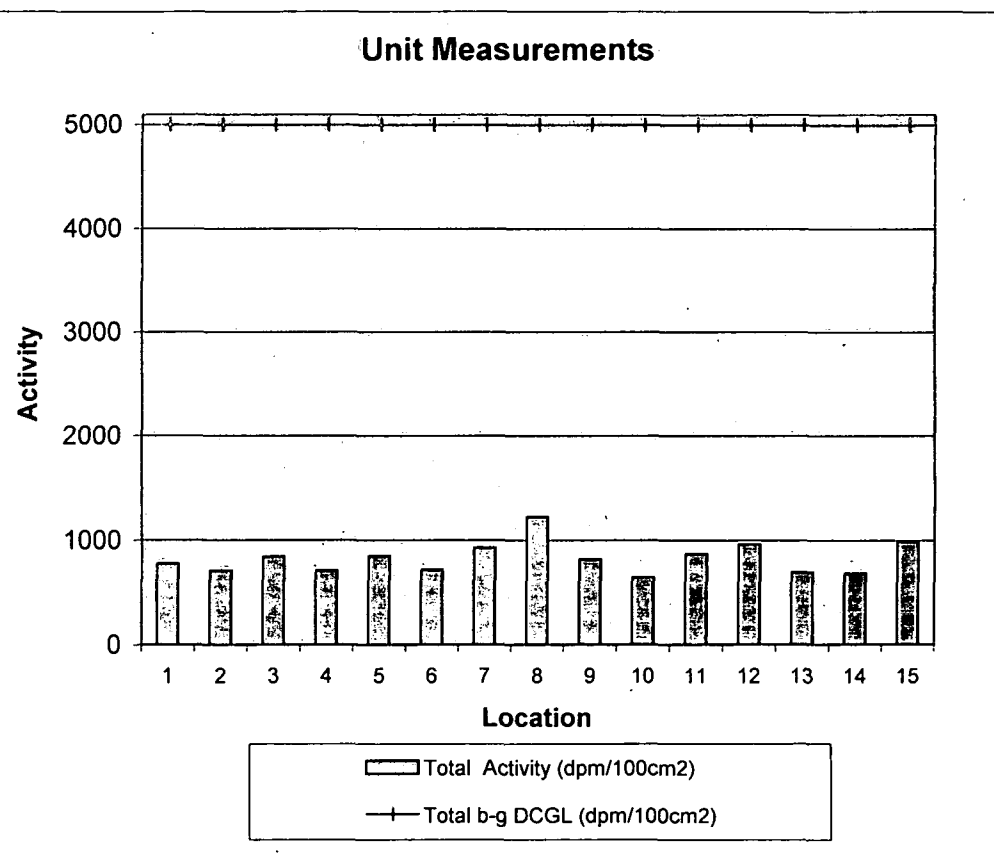
TSA Beta-Gamma

883001

7/10/01

			Instrument	<u>392</u>	<u>1420</u> QA Instrument
standard deviation:	153.2	max:	1224.7	Ave. Instrument background:	514.8 cpm 487.8 cpm
mean:	826.6	min:	646.8	Instrument efficiency:	30.8% 33.35%
median:	815.6			Instrument MDA:	322 dpm 296 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Total β - γ DCGL (dpm/100cm ²)
1	883 E. Roof	753.0	513.0	773.4	5000
2	883 E. Roof	733.0	498.0	708.4	5000
3	883 E. Roof	774.0	505.0	841.6	5000
4	883 E. Roof	733.0	524.0	708.4	5000
5	883 E. Roof	775.0	495.0	844.8	5000
6	883 E. Roof	735.0	496.0	714.9	5000
7	883 E. Roof	800.0	545.0	926.0	5000
8	883 E. Roof	892.0	605.0	1224.7	5000
9	883 E. Roof	766.0	448.0	815.6	5000
10	883 E. Roof	714.0	499.0	646.8	5000
11	883 E. Roof	782.0	490.0	867.5	5000
12	883 E. Roof	811.0	553.0	961.7	5000
13	883 E. Roof	729.0	484.0	695.5	5000
14	883 E. Roof	725.0	525.0	682.5	5000
15	883 E. Roof	819.0	542.0	987.7	5000
1 QC	883 E. Roof	703.0	479.0	645.3	5000
2 QC	883 E. Roof	728.0	494.0	720.2	5000



101

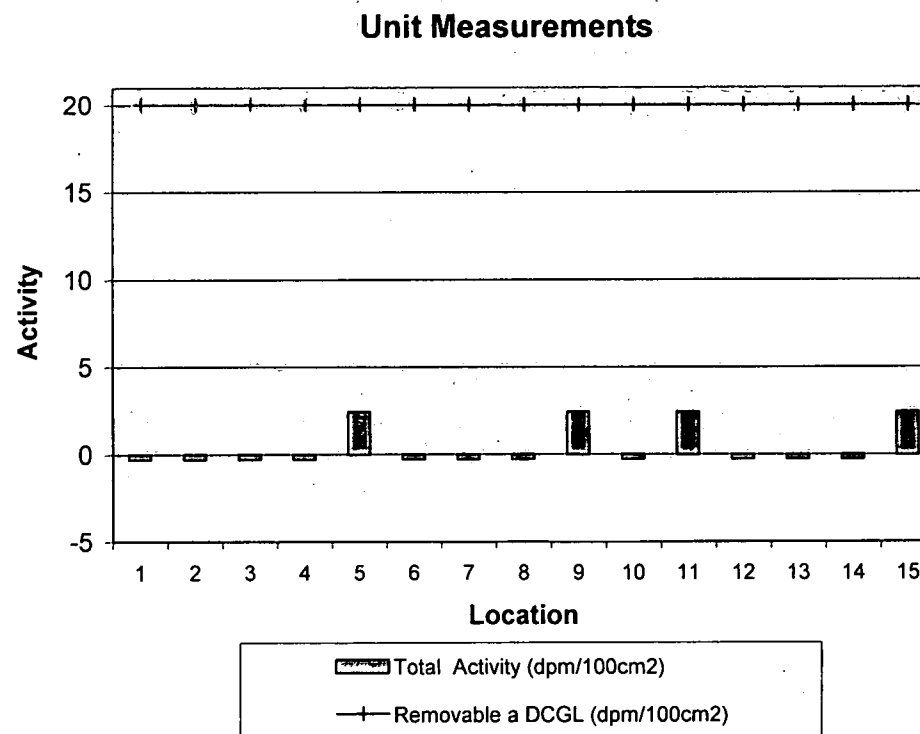
Removable Activity - Alpha

883001

7/10/01

				Instrument:	155596
standard deviation:	1.2	max:	2.4	Ave. Instrument background:	0.1 cpm
mean:	0.4	min:	-0.3	Instrument efficiency:	37.2%
median:	-0.3			Instrument MDA:	18 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Removable α DCGL (dpm/100cm ²)
1	883 E. Roof	0.0	0.1	-0.3	20
2	883 E. Roof	0.0	0.1	-0.3	20
3	883 E. Roof	0.0	0.1	-0.3	20
4	883 E. Roof	0.0	0.1	-0.3	20
5	883 E. Roof	1.0	0.1	2.4	20
6	883 E. Roof	0.0	0.1	-0.3	20
7	883 E. Roof	0.0	0.1	-0.3	20
8	883 E. Roof	0.0	0.1	-0.3	20
9	883 E. Roof	1.0	0.1	2.4	20
10	883 E. Roof	0.0	0.1	-0.3	20
11	883 E. Roof	1.0	0.1	2.4	20
12	883 E. Roof	0.0	0.1	-0.3	20
13	883 E. Roof	0.0	0.1	-0.3	20
14	883 E. Roof	0.0	0.1	-0.3	20
15	883 E. Roof	1.0	0.1	2.4	20



102
99

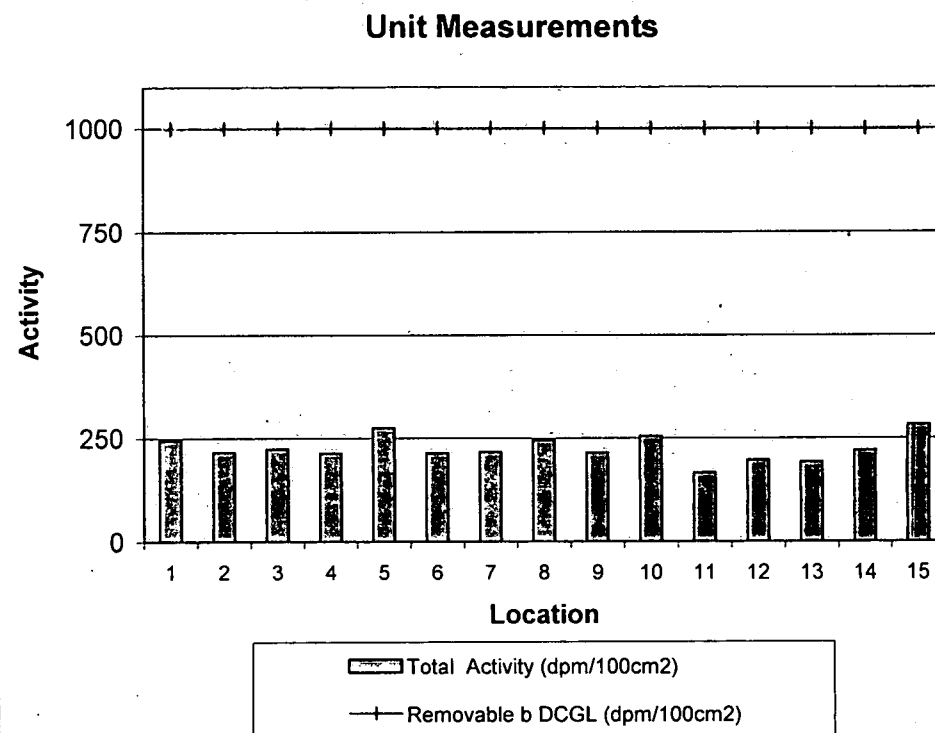
Removable Activity - Beta-Gamma

883001

7/10/01

			Instrument: <u>155596</u>	
standard deviation:	30.8	max:	282.8	Ave. Instrument background: 102.0 cpm
mean:	225.4	min:	166.7	Instrument efficiency: 39.6%
median:	217.2	Instrument MDA: 95 dpm		

	Surface Location	Total Counts (cpm/100cm ²)	Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Removable β DCGL (dpm/100cm ²)
1	883 E. Roof	199.0	102.0	244.9	1000
2	883 E. Roof	188.0	102.0	217.2	1000
3	883 E. Roof	191.0	102.0	224.7	1000
4	883 E. Roof	187.0	102.0	214.6	1000
5	883 E. Roof	211.0	102.0	275.3	1000
6	883 E. Roof	187.0	102.0	214.6	1000
7	883 E. Roof	188.0	102.0	217.2	1000
8	883 E. Roof	199.0	102.0	244.9	1000
9	883 E. Roof	187.0	102.0	214.6	1000
10	883 E. Roof	203.0	102.0	255.1	1000
11	883 E. Roof	168.0	102.0	166.7	1000
12	883 E. Roof	180.0	102.0	197.0	1000
13	883 E. Roof	178.0	102.0	191.9	1000
14	883 E. Roof	189.0	102.0	219.7	1000
15	883 E. Roof	214.0	102.0	282.8	1000



103

~~102~~

RADIOLOGICAL CLOSEOUT SURVEY FOR

Survey Area: 883001

Survey Unit: 883001

Classification: 3

Building: 883

Survey Unit Description: 883 East Roof Exterior

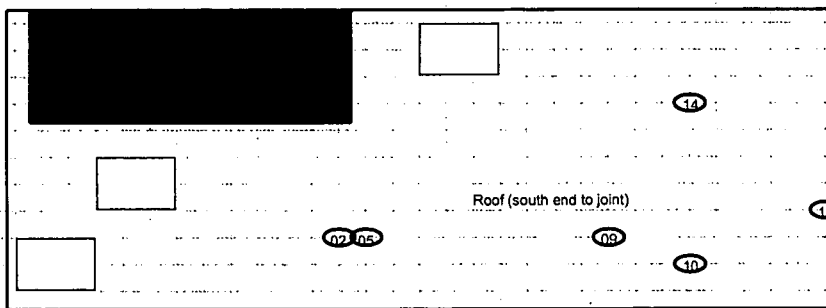
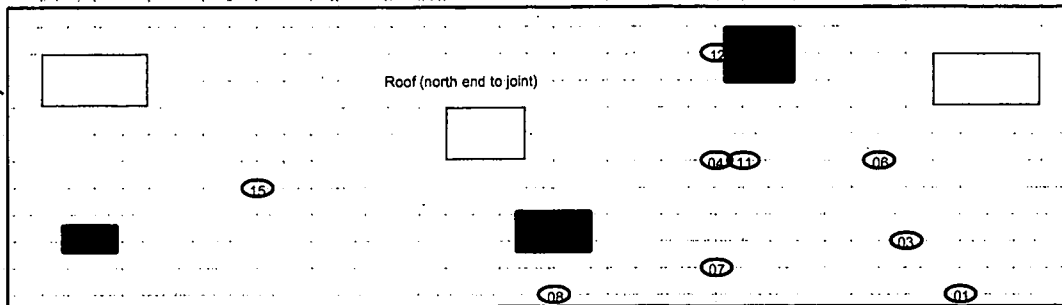
Total Floor Area: NA

Total Area: 713 sq. m

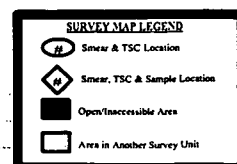
Grid Size: N/A

SURVEY UNIT 883001 - MAP 1 OF 1

Expansion Joint



Scan Area



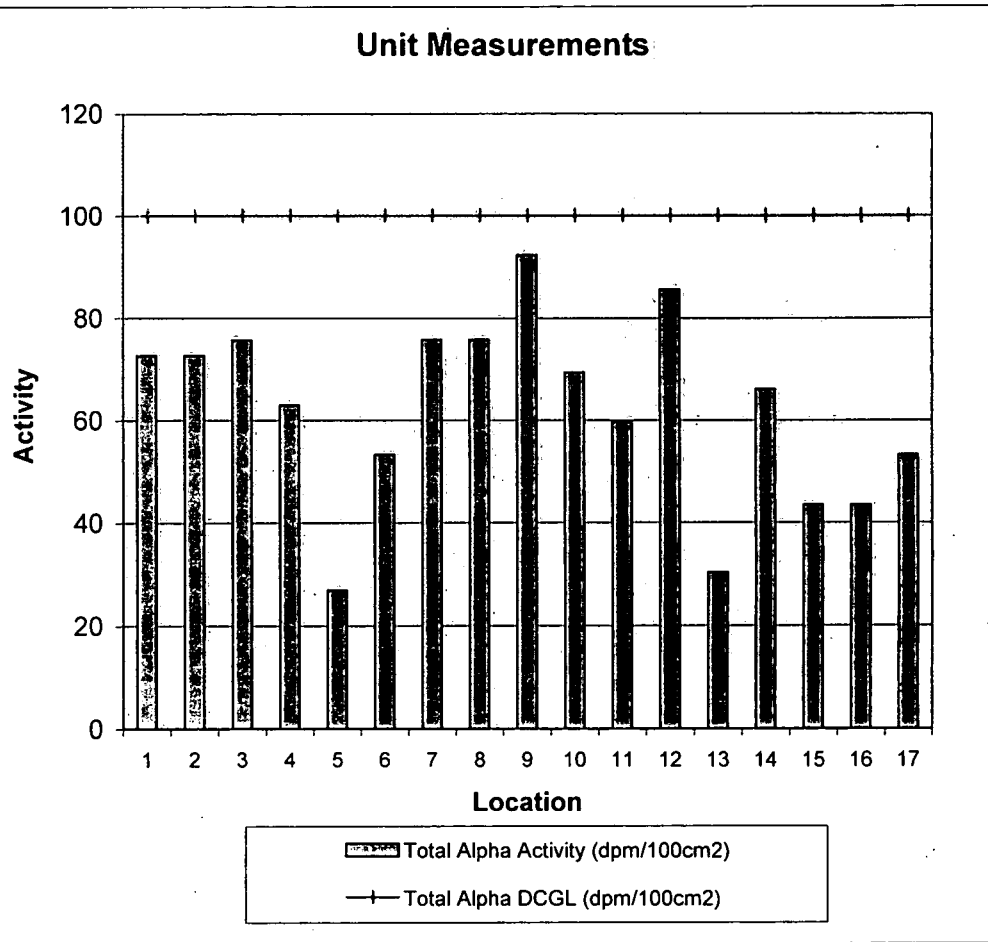
TSA Alpha

883002

7/13/01

				Instrument:	<u>392</u>	<u>1420</u> QA Instrument
standard deviation:	18.7	max:	92.2	Ave. Instrument background:	1.8 cpm	1.7 cpm
mean:	64.1	min:	26.9	Instrument efficiency:	20.5%	21.95%
median:	69.3			Instrument MDA:	48 dpm	48 dpm

	Surface Location	Total Alpha Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Alpha Activity (dpm/100cm ²)	Total Alpha DCGL (dpm/100cm ²)
1	W. section 883 roof.	16.7	0.0	72.7	100
2	W. section 883 roof.	16.7	2.7	72.7	100
3	W. section 883 roof.	17.3	0.7	75.6	100
4	W. section 883 roof.	14.7	1.3	63.0	100
5	W. section 883 roof.	7.3	0.7	26.9	100
6	W. section 883 roof.	12.7	0.7	53.2	100
7	W. section 883 roof.	17.3	2.0	75.6	100
8	W. section 883 roof.	17.3	2.0	75.6	100
9	W. section 883 roof.	20.7	0.7	92.2	100
10	W. section 883 roof.	16.0	2.7	69.3	100
11	W. section 883 roof.	14.0	3.3	59.5	100
12	W. section 883 roof.	19.3	2.7	85.4	100
13	W. section 883 roof.	8.0	2.0	30.3	100
14	W. section 883 roof.	15.3	2.7	65.9	100
15	W. section 883 roof.	10.7	2.7	43.4	100
16	W. section 883 roof.	10.7	1.3	43.4	100
17	W. section 883 roof.	12.7	2.0	53.2	100
1 QC	W. section 883 roof.	16.0	0.7	65.1	100
2 QC	W. section 883 roof.	14.7	2.7	59.2	100



105
X02

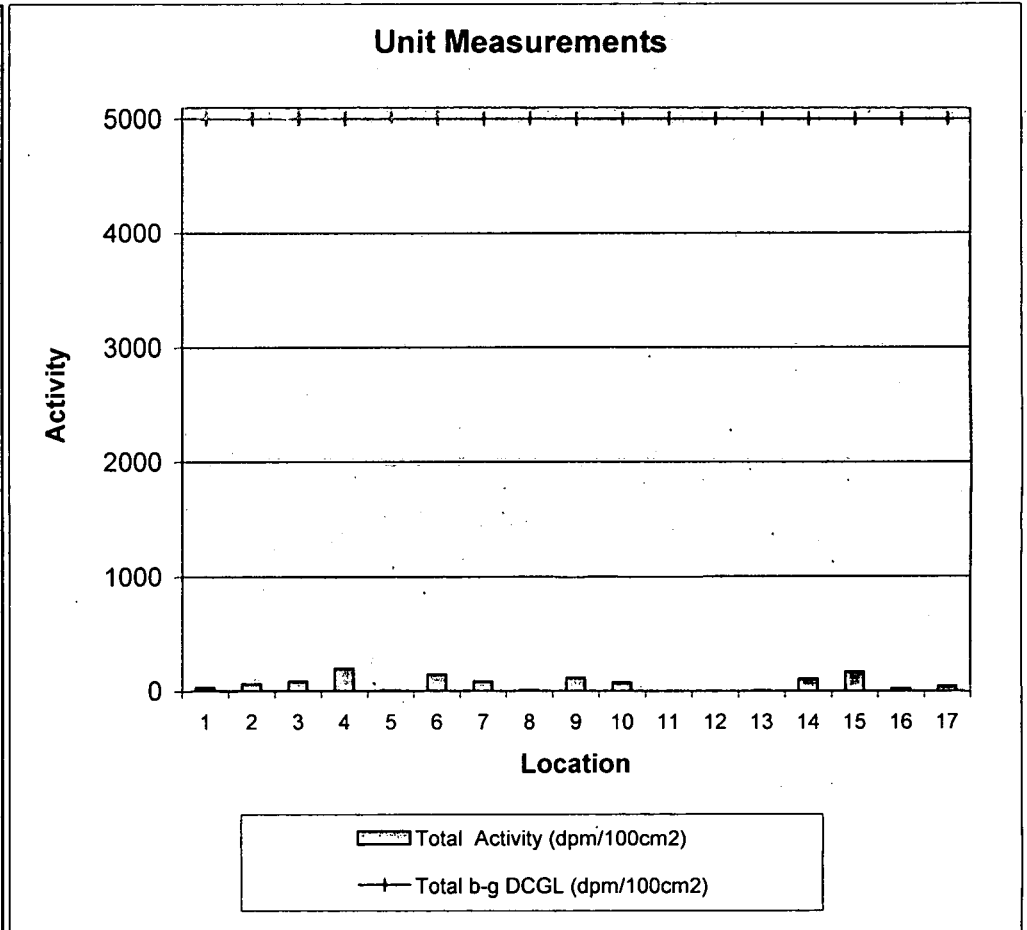
TSA Beta-Gamma

883002

7/13/01

				Instrument:	<u>392</u>	<u>1420</u> QA Instrument
standard deviation:	74.0	max:	194.8	Ave. Instrument background:	389.2 cpm	366.5 cpm
mean:	64.7	min:	-68.2	Instrument efficiency:	30.8%	33.35%
median:	71.4			Instrument MDA:	277 dpm	226 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Total β-γ DCGL (dpm/100cm ²)
1	W. section 883 roof.	364.0	355.0	29.2	5000
2	W. section 883 roof.	419.0	401.0	58.4	5000
3	W. section 883 roof.	446.0	420.0	84.4	5000
4	W. section 883 roof.	423.0	363.0	194.8	5000
5	W. section 883 roof.	426.0	425.0	3.2	5000
6	W. section 883 roof.	447.0	402.0	146.1	5000
7	W. section 883 roof.	443.0	417.0	84.4	5000
8	W. section 883 roof.	404.0	402.0	6.5	5000
9	W. section 883 roof.	453.0	418.0	113.6	5000
10	W. section 883 roof.	389.0	367.0	71.4	5000
11	W. section 883 roof.	367.0	388.0	-68.2	5000
12	W. section 883 roof.	385.0	393.0	-26.0	5000
13	W. section 883 roof.	375.0	374.0	3.2	5000
14	W. section 883 roof.	393.0	361.0	103.9	5000
15	W. section 883 roof.	403.0	352.0	165.6	5000
16	W. section 883 roof.	335.0	329.0	19.5	5000
17	W. section 883 roof.	363.0	351.0	39.0	5000
1 QC	W. section 883 roof.	405.0	336.0	206.9	5000
2 QC	W. section 883 roof.	422.0	397.0	75.0	5000



106
X123

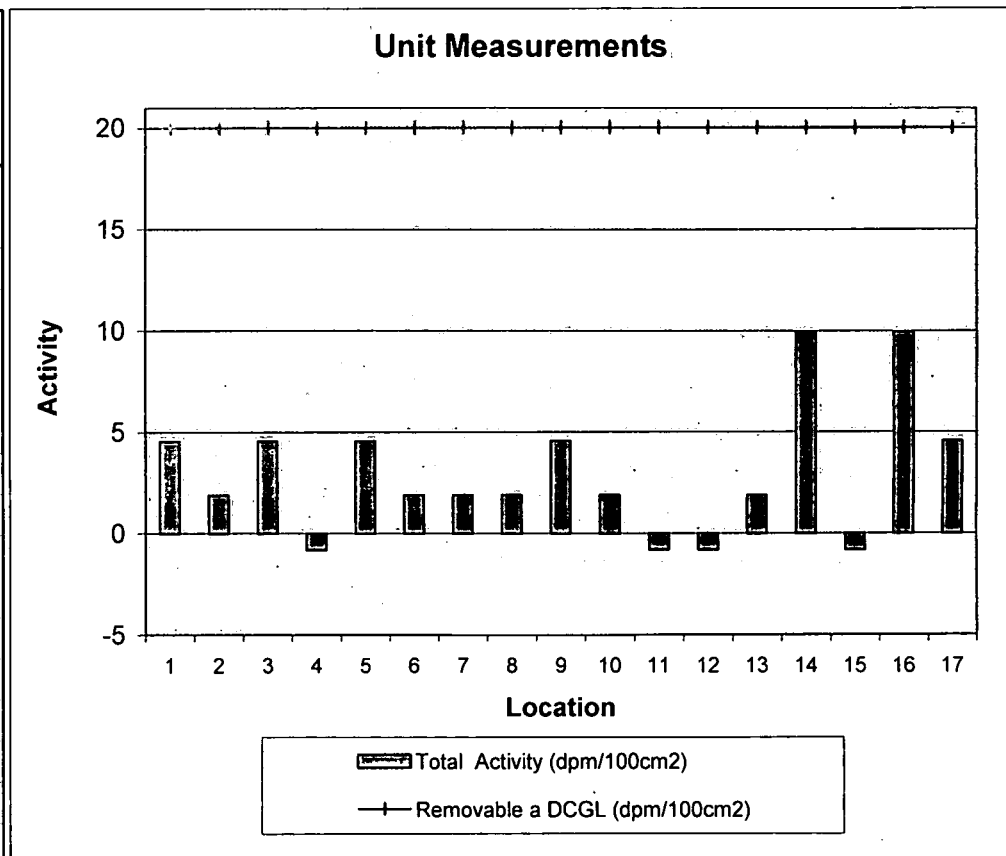
Removable Activity - Alpha

883002

7/13/01

				Instrument:	155596
standard deviation:	3.3	max:	9.9	Ave. Instrument background:	0.3 cpm
mean:	3.0	min:	-0.8	Instrument efficiency:	37.2%
median:	1.9			Instrument MDA:	13 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Removable α DCGL (dpm/100cm ²)
1	W. section 883 roof.	2.0	0.3	4.6	20
2	W. section 883 roof.	1.0	0.3	1.9	20
3	W. section 883 roof.	2.0	0.3	4.6	20
4	W. section 883 roof.	0.0	0.3	-0.8	20
5	W. section 883 roof.	2.0	0.3	4.6	20
6	W. section 883 roof.	1.0	0.3	1.9	20
7	W. section 883 roof.	1.0	0.3	1.9	20
8	W. section 883 roof.	1.0	0.3	1.9	20
9	W. section 883 roof.	2.0	0.3	4.6	20
10	W. section 883 roof.	1.0	0.3	1.9	20
11	W. section 883 roof.	0.0	0.3	-0.8	20
12	W. section 883 roof.	0.0	0.3	-0.8	20
13	W. section 883 roof.	1.0	0.3	1.9	20
14	W. section 883 roof.	4.0	0.3	9.9	20
15	W. section 883 roof.	0.0	0.3	-0.8	20
16	W. section 883 roof.	4.0	0.3	9.9	20
17	W. section 883 roof.	2.0	0.3	4.6	20



107
~~104~~

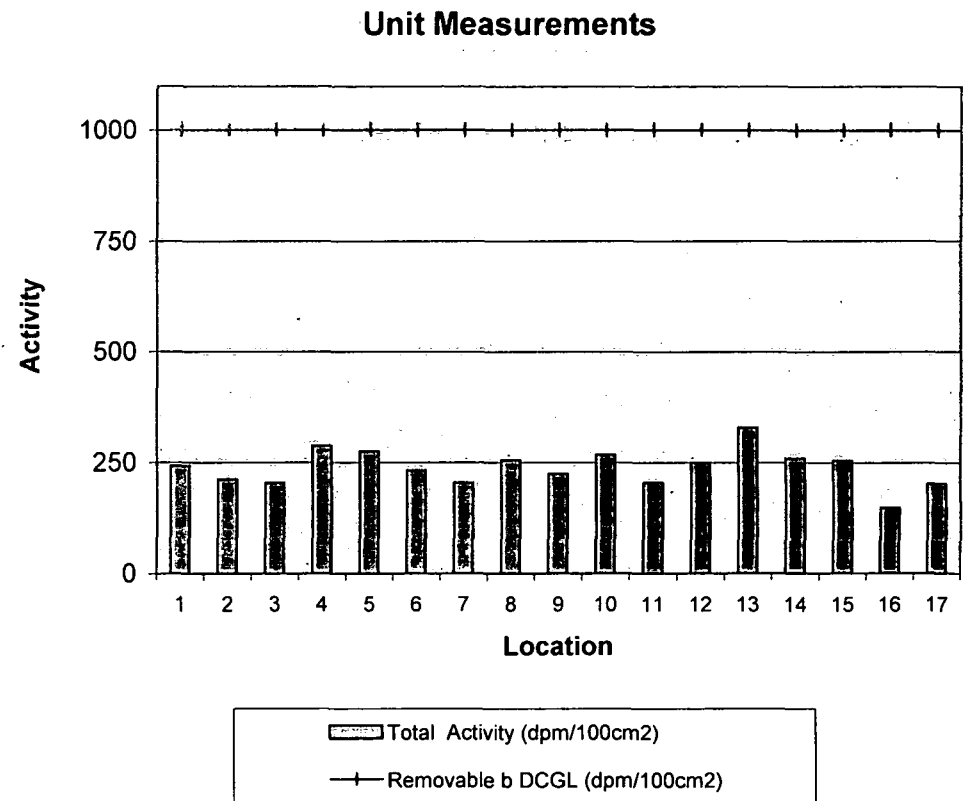
Removable Activity - Beta-Gamma

883002

7/13/01

			Instrument: 155596	
standard deviation:	35.0	max:	328.3	Ave. Instrument background: 99.0 cpm
mean:	247.0	min:	204.5	Instrument efficiency: 39.6%
median:	250.0	Instrument MDA: 94 dpm		

	Surface Location	Total Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Removable β DCGL (dpm/100cm ²)
1	W. section 883 roof.	195.0	99.0	242.4	1000
2	W. section 883 roof.	183.0	99.0	212.1	1000
3	W. section 883 roof.	180.0	99.0	204.5	1000
4	W. section 883 roof.	213.0	99.0	287.9	1000
5	W. section 883 roof.	208.0	99.0	275.3	1000
6	W. section 883 roof.	191.0	99.0	232.3	1000
7	W. section 883 roof.	180.0	99.0	204.5	1000
8	W. section 883 roof.	200.0	99.0	255.1	1000
9	W. section 883 roof.	188.0	99.0	224.7	1000
10	W. section 883 roof.	205.0	99.0	267.7	1000
11	W. section 883 roof.	180.0	99.0	204.5	1000
12	W. section 883 roof.	198.0	99.0	250.0	1000
13	W. section 883 roof.	229.0	99.0	328.3	1000
14	W. section 883 roof.	202.0	99.0	260.1	1000
15	W. section 883 roof.	200.0	99.0	255.1	1000
16	W. section 883 roof.	158.0	99.0	149.0	1000
17	W. section 883 roof.	179.0	99.0	202.0	1000



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RADIOLOGICAL CLOSEOUT SURVEY FOR

Survey Area: 883002

Survey Unit: 883002

Classification: 3

Building: 883

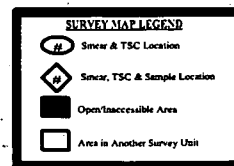
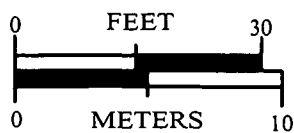
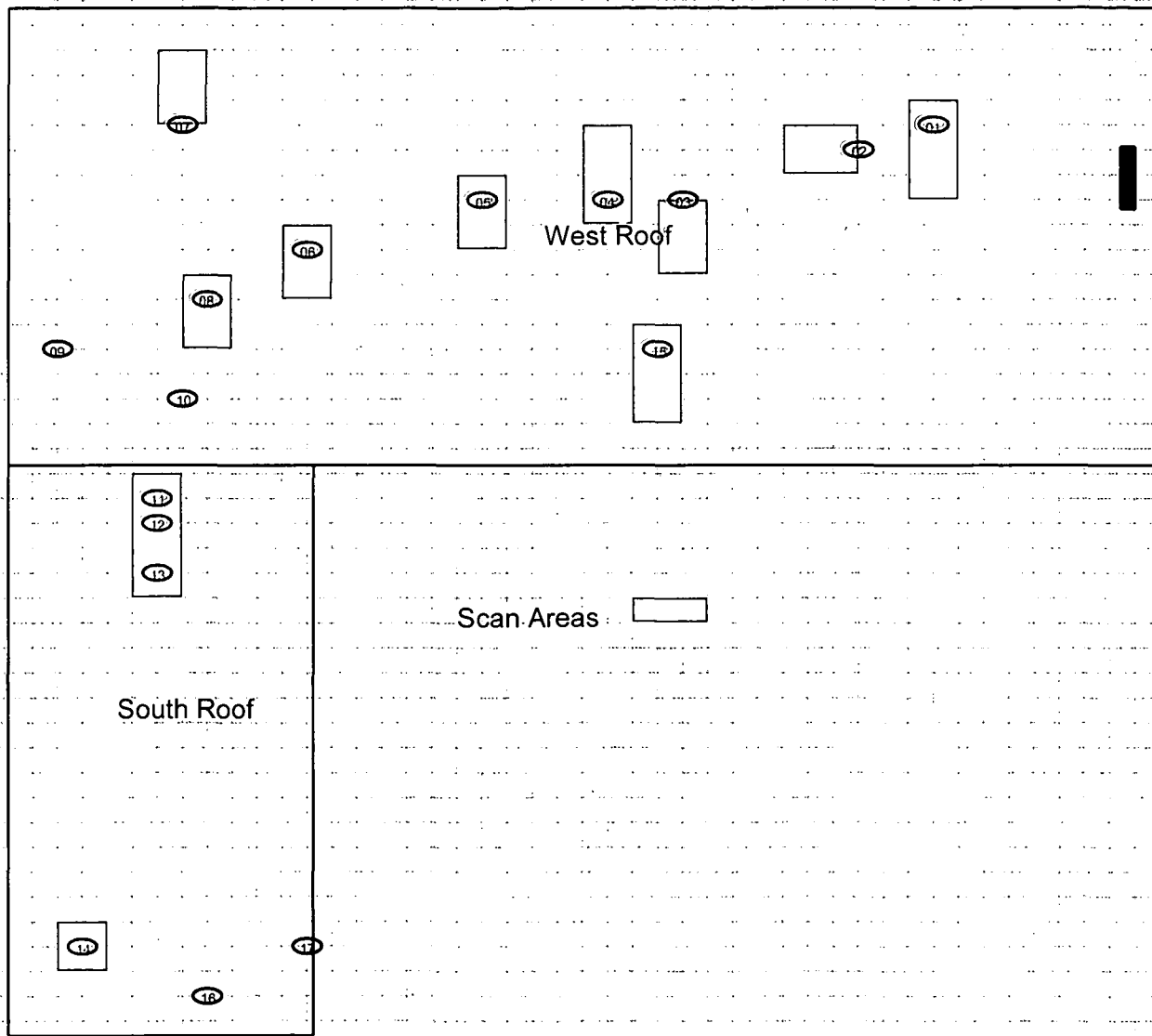
Survey Unit Description: West/South 883 Addition Roof Exterior

Total Floor Area: NA

Total Area: 1117 sq. m

Grid Size: N/A

SURVEY UNIT 883002 - MAP 1 OF 1



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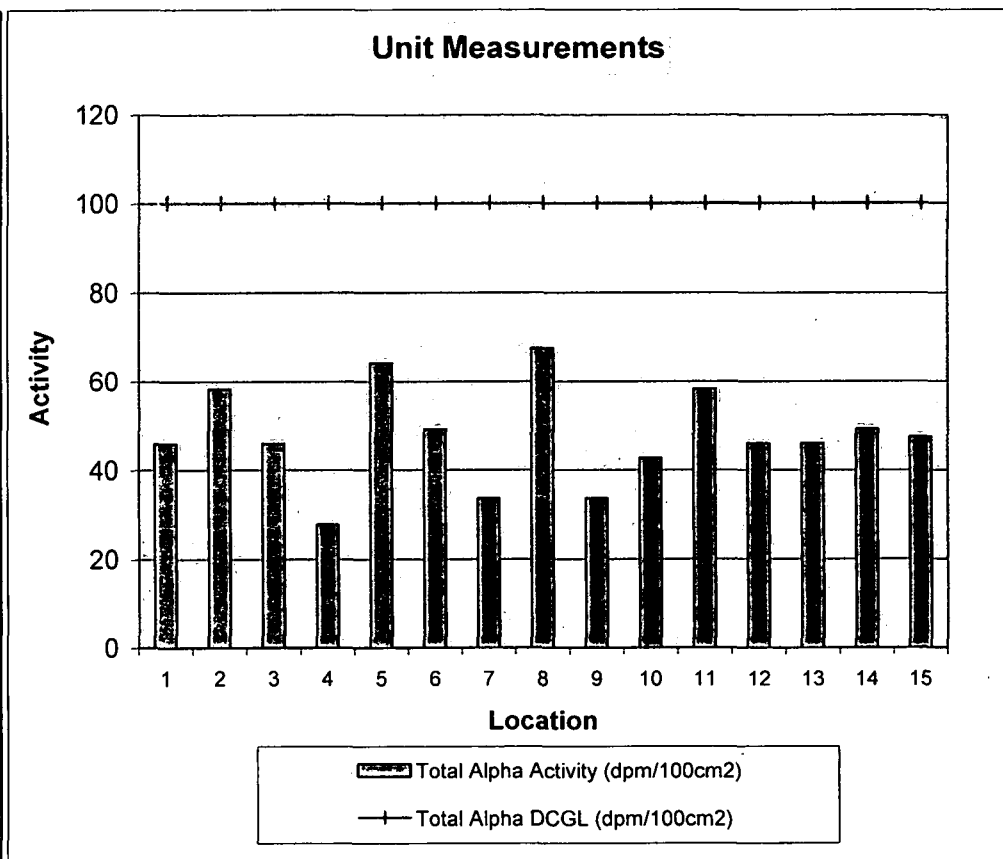
TSA Alpha

883003

7/16/01

				Instrument:	1420	1682 QA Instrument
standard deviation:	11.1	max:	67.4	Ave. Instrument background:	1.9 cpm	2 cpm
mean:	47.7	min:	27.8	Instrument efficiency:	22.0%	22.00%
median:	46.0			Instrument MDA:	48 dpm	48 dpm

	Surface Location	Total Alpha Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Alpha Activity (dpm/100cm ²)	Total Alpha DCGL (dpm/100cm ²)
1	883 N. Roof	12.0	0.7	46.0	100
2	883 N. Roof	14.7	1.3	58.3	100
3	883 N. Roof	12.0	2.7	46.0	100
4	883 N. Roof	8.0	0.7	27.8	100
5	883 N. Roof	16.0	2.0	64.2	100
6	883 N. Roof	12.7	3.3	49.2	100
7	883 N. Roof	9.3	5.3	33.7	100
8	883 N. Roof	16.7	3.3	67.4	100
9	883 N. Roof	9.3	0.7	33.7	100
10	883 N. Roof	11.3	1.3	42.8	100
11	883 N. Roof	14.7	2.7	58.3	100
12	883 N. Roof	12.0	0.0	46.0	100
13	883 N. Roof	12.0	2.0	46.0	100
14	883 N. Roof	12.7	1.3	49.2	100
15	883 N. Roof	12.3	1.3	47.4	100
11 QC	883 N. Roof	12.0	2.7	45.5	100
13 QC	883 N. Roof	9.3	0.0	33.2	100



110
107

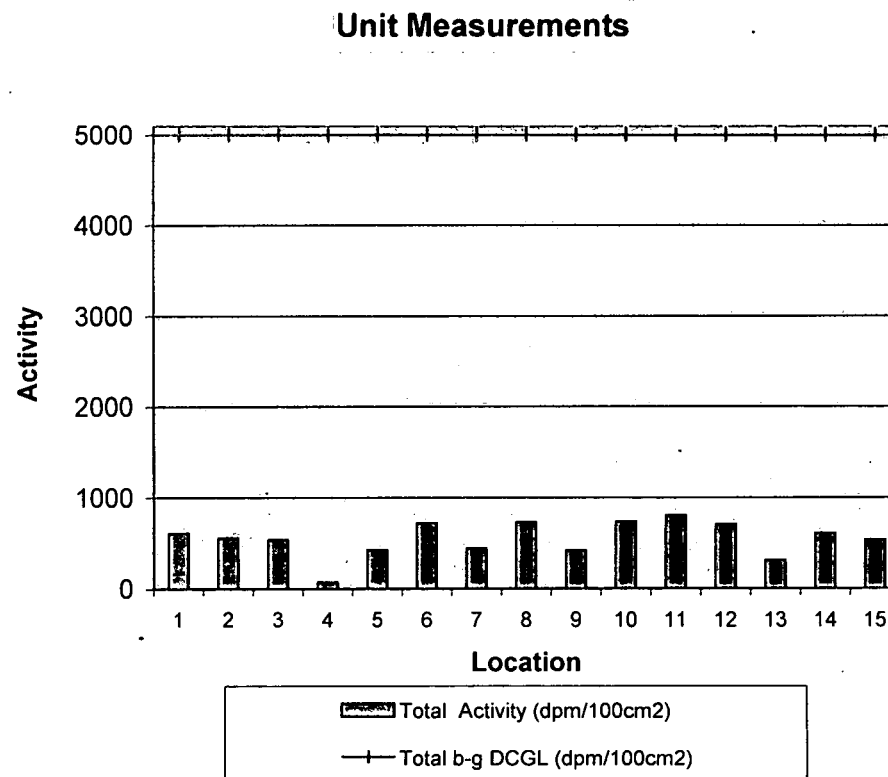
TSA Beta-Gamma

883003

7/16/01

				Instrument:	<u>1420</u>	<u>1682</u> QA Instrument
standard deviation:	193.3	max:	801.0	Ave. Instrument background:	469.9 cpm	504.0 cpm
mean:	544.9	min:	66.4	Instrument efficiency:	33.4%	30.20%
median:	555.1			Instrument MDA:	210 dpm	280 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Total β - γ DCGL (dpm/100cm ²)
1	883 N. Roof	671.0	408.0	603.1	5000
2	883 N. Roof	655.0	456.0	555.1	5000
3	883 N. Roof	648.0	445.0	534.1	5000
4	883 N. Roof	492.0	557.0	66.4	5000
5	883 N. Roof	611.0	439.0	423.2	5000
6	883 N. Roof	709.0	487.0	717.0	5000
7	883 N. Roof	617.0	462.0	441.2	5000
8	883 N. Roof	712.0	523.0	726.0	5000
9	883 N. Roof	609.0	456.0	417.2	5000
10	883 N. Roof	715.0	457.0	735.0	5000
11	883 N. Roof	737.0	521.0	801.0	5000
12	883 N. Roof	706.0	473.0	708.0	5000
13	883 N. Roof	574.0	449.0	312.2	5000
14	883 N. Roof	671.0	471.0	603.1	5000
15	883 N. Roof	647.0	444.0	531.1	5000
11 QC	883 N. Roof	842.0	556.0	1119.2	5000
13 QC	883 N. Roof	585.0	452.0	268.2	5000



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708

Removable Activity - Alpha

883003

7/16/01

Instrument : 155596

standard deviation: 1.2 max: 2.2

Ave. Instrument background: 0.2 cpm

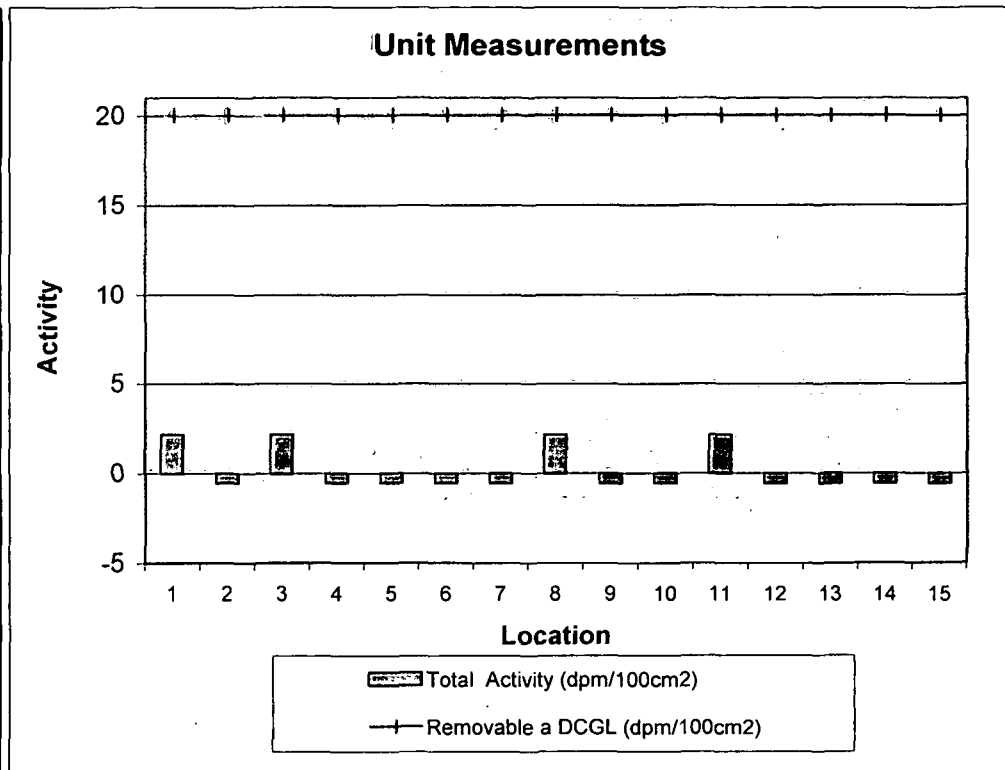
mean: 0.2 min: -0.5

Instrument efficiency: 37.2%

median: -0.5

Instrument MDA: 7 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Removable α DCGL (dpm/100cm ²)
1	883 N. Roof	1.0	0.2	2.2	20
2	883 N. Roof	0.0	0.2	-0.5	20
3	883 N. Roof	1.0	0.2	2.2	20
4	883 N. Roof	0.0	0.2	-0.5	20
5	883 N. Roof	0.0	0.2	-0.5	20
6	883 N. Roof	0.0	0.2	-0.5	20
7	883 N. Roof	0.0	0.2	-0.5	20
8	883 N. Roof	1.0	0.2	2.2	20
9	883 N. Roof	0.0	0.2	-0.5	20
10	883 N. Roof	0.0	0.2	-0.5	20
11	883 N. Roof	1.0	0.2	2.2	20
12	883 N. Roof	0.0	0.2	-0.5	20
13	883 N. Roof	0.0	0.2	-0.5	20
14	883 N. Roof	0.0	0.2	-0.5	20
15	883 N. Roof	0.0	0.2	-0.5	20



112
109

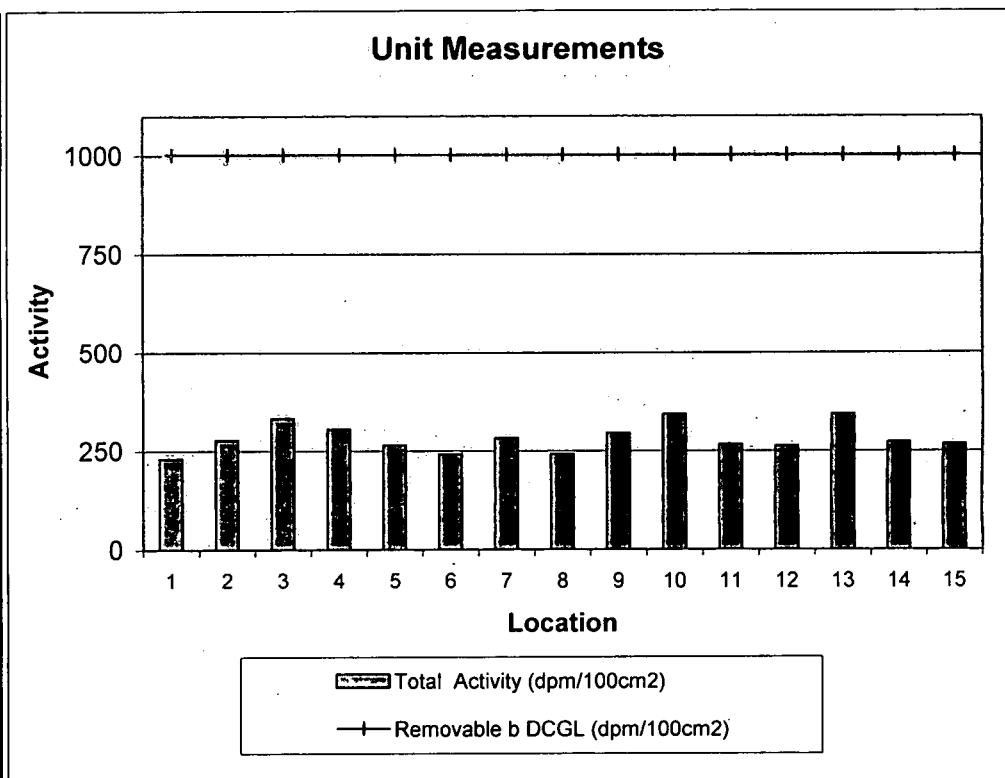
Removable Activity - Beta-Gamma

883003

7/16/01

			Instrument: : 155596	
standard deviation:	35.8	max:	343.4	Ave. Instrument background: 102.0 cpm
mean:	282.2	min:	229.8	Instrument efficiency: 39.6%
median:	272.7	Instrument MDA: 69 dpm		

	Surface Location	Total Counts (cpm/100cm ²)	Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Removable β DCGL (dpm/100cm ²)
1	883 N. Roof	193.0	102.0	229.8	1000
2	883 N. Roof	212.0	102.0	277.8	1000
3	883 N. Roof	234.0	102.0	333.3	1000
4	883 N. Roof	223.0	102.0	305.6	1000
5	883 N. Roof	207.0	102.0	265.2	1000
6	883 N. Roof	198.0	102.0	242.4	1000
7	883 N. Roof	214.0	102.0	282.8	1000
8	883 N. Roof	198.0	102.0	242.4	1000
9	883 N. Roof	219.0	102.0	295.5	1000
10	883 N. Roof	238.0	102.0	343.4	1000
11	883 N. Roof	208.0	102.0	267.7	1000
12	883 N. Roof	206.0	102.0	262.6	1000
13	883 N. Roof	238.0	102.0	343.4	1000
14	883 N. Roof	210.0	102.0	272.7	1000
15	883 N. Roof	208.0	102.0	267.7	1000



113
112

RADIOLOGICAL CLOSEOUT SURVEY FOR

Survey Area: 883003

Survey Unit: 883003

Classification: 3

Building: 883

Survey Unit Description: Main Building Roof (north end) Exterior

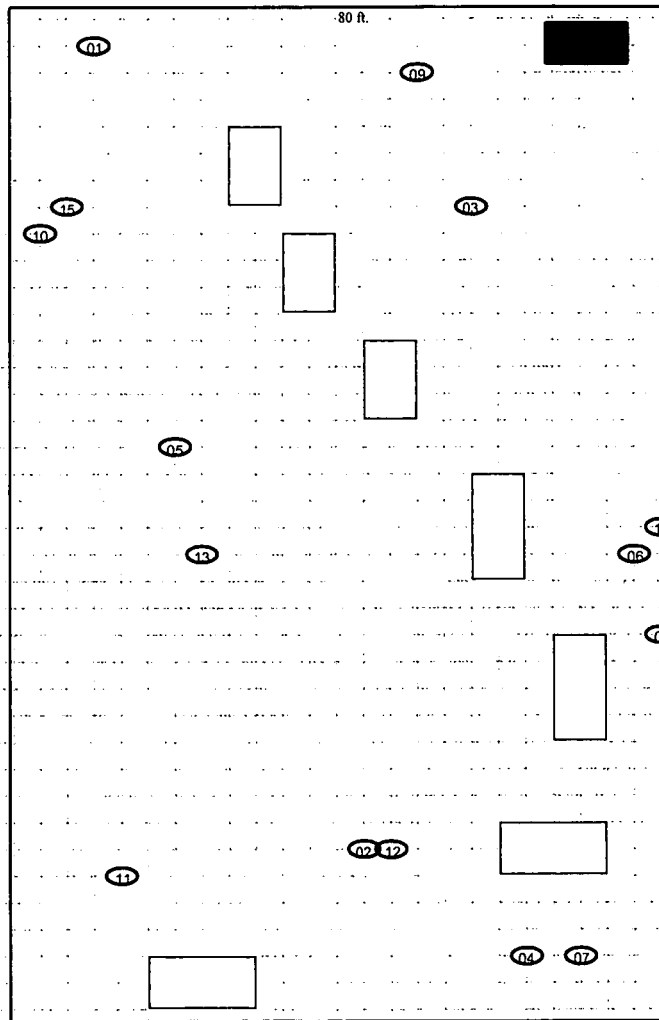
Total Floor Area: NA

Total Area: 915 sq. m

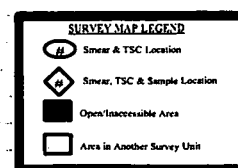
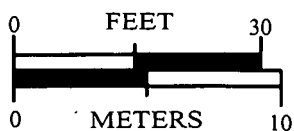
Grid Size: N/A

SURVEY UNIT 883003 - MAP 1 OF 1

North end roof

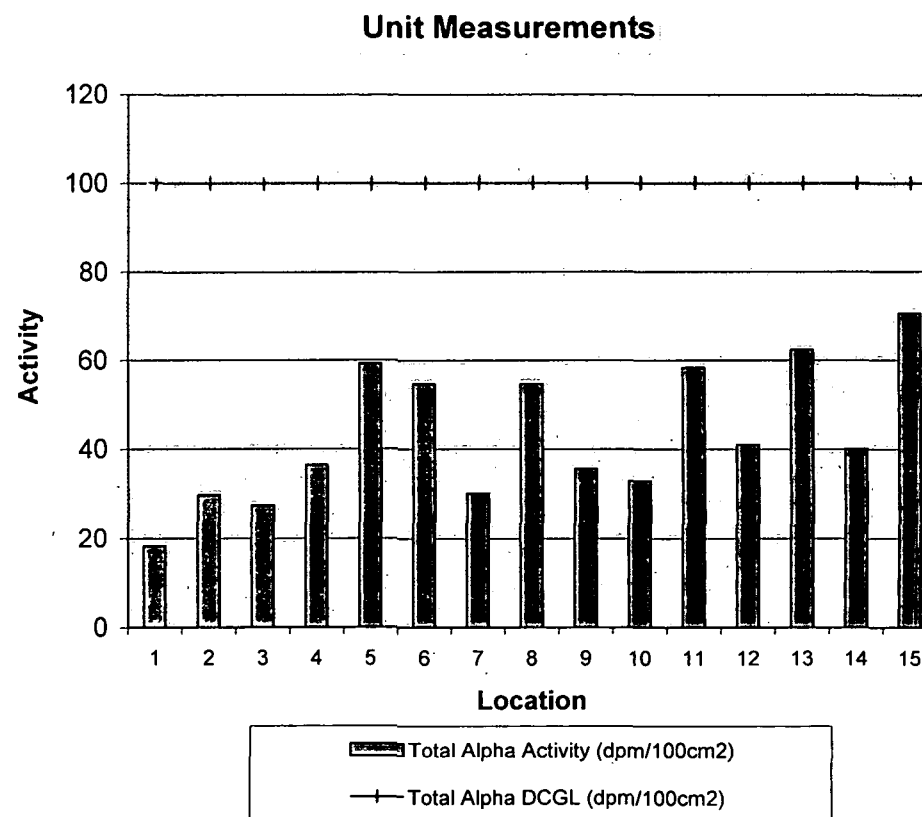


Scan Area



				Instrument	<u>1420</u>	<u>1682</u> QA Instrument
standard deviation:	15.4	max:	70.6	Ave. Instrument background:	2.7 cpm	2 cpm
mean:	43.4	min:	18.2	Instrument efficiency:	22.0%	22.00%
median:	40.1			Instrument MDA:	48 dpm	48 dpm

	Surface Location	Total Alpha Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Alpha Activity (dpm/100cm ²)	Total Alpha DCGL (dpm/100cm ²)
1	883 N. Roof	6.0	2.0	18.2	100
2	883 N. Roof	10.0	3.5	29.6	100
3	883 N. Roof	8.0	2.0	27.3	100
4	883 N. Roof	9.0	1.0	36.4	100
5	883 N. Roof	13.0	0.0	59.2	100
6	883 N. Roof	14.0	2.0	54.7	100
7	883 N. Roof	12.6	6.0	30.1	100
8	883 N. Roof	17.0	5.0	54.7	100
9	883 N. Roof	11.0	3.2	35.5	100
10	883 N. Roof	9.0	1.8	32.8	100
11	883 N. Roof	15.6	2.8	58.3	100
12	883 N. Roof	13.0	4.0	41.0	100
13	883 N. Roof	16.7	3.0	62.4	100
14	883 N. Roof	10.6	1.8	40.1	100
15	883 N. Roof	17.5	2.0	70.6	100
13 QC	883 N. Roof	13.3	2.0	51.4	100
9 QC	883 N. Roof	11.3	3.0	37.7	100



115
112

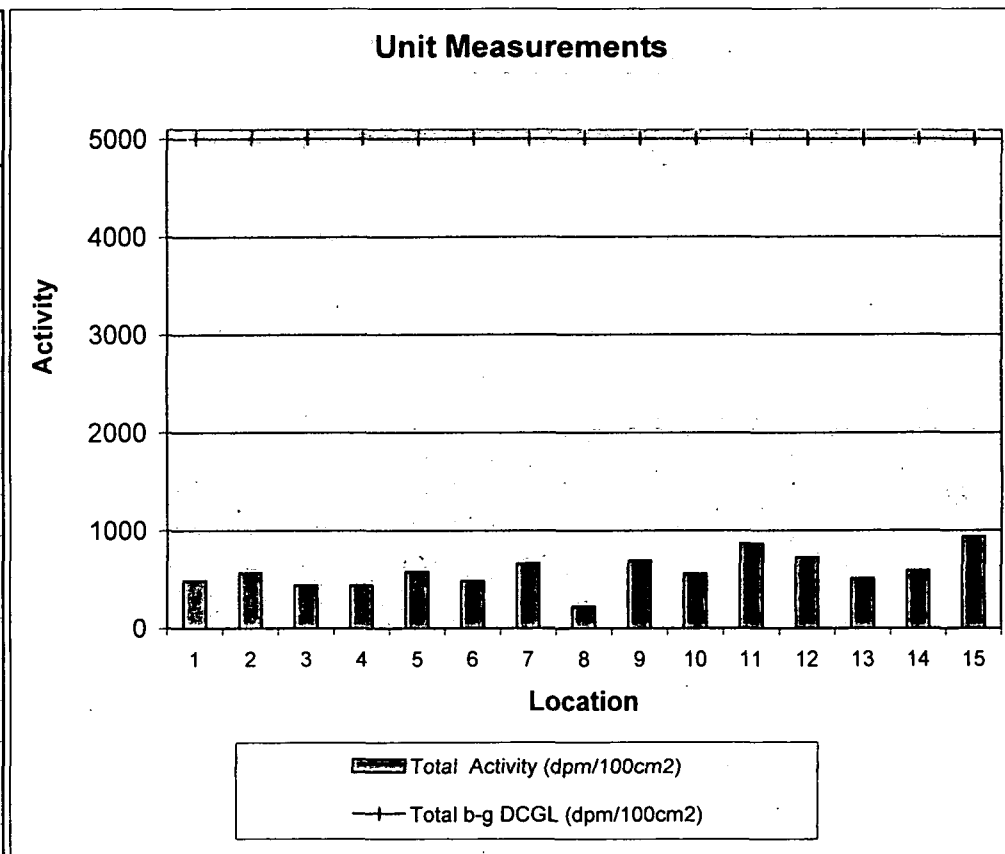
TSA Beta-Gamma

883004

7/16/01

				Instrument	<u>1420</u>	<u>1682</u> QA Instrument
standard deviation:	178.2	max:	935.5	Ave. Instrument background:	433.4 cpm	488.5 cpm
mean:	580.1	min:	215.9	Instrument efficiency:	33.4%	30.20%
median:	563.7			Instrument MDA:	210 dpm	280 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Total β-γ DCGL (dpm/100cm ²)
1	883 N. Roof	615.0	453.0	485.8	5000
2	883 N. Roof	614.0	426.0	563.7	5000
3	883 N. Roof	552.0	407.0	434.8	5000
4	883 N. Roof	608.0	463.0	434.8	5000
5	883 N. Roof	604.0	411.0	578.7	5000
6	883 N. Roof	599.0	438.0	482.8	5000
7	883 N. Roof	637.0	418.0	656.7	5000
8	883 N. Roof	559.0	487.0	215.9	5000
9	883 N. Roof	646.0	417.0	686.7	5000
10	883 N. Roof	586.0	402.0	551.7	5000
11	883 N. Roof	707.0	419.0	863.6	5000
12	883 N. Roof	667.0	426.0	722.6	5000
13	883 N. Roof	653.0	485.0	503.7	5000
14	883 N. Roof	615.0	420.0	584.7	5000
15	883 N. Roof	741.0	429.0	935.5	5000
13 QC	883 N. Roof	642.0	455.0	619.2	5000
9 QC	883 N. Roof	603.0	522.0	268.2	5000



X3
176

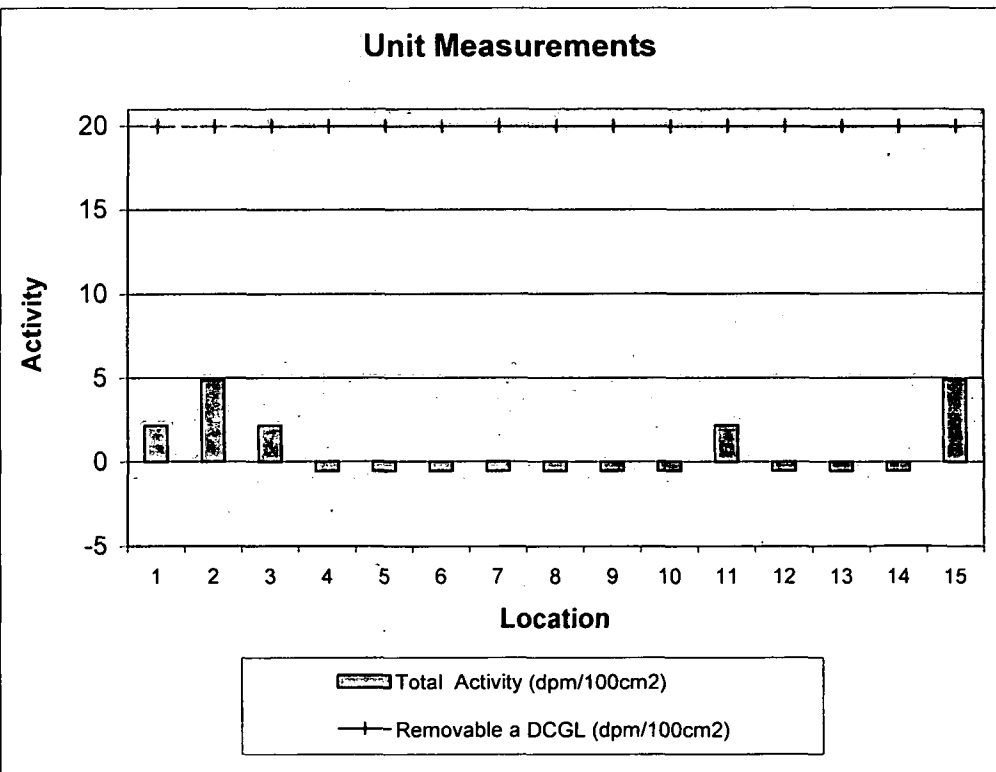
Removable Activity - Alpha

883004

7/16/01

				Instrument:	155596
standard deviation:	2.0	max:	4.8	Ave. Instrument background:	0.2 cpm
mean:	0.7	min:	-0.5	Instrument efficiency:	37.2%
median:	-0.5	Instrument MDA:			

	Surface Location	Total Counts (cpm/100cm ²)	Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Removable α DCGL (dpm/100cm ²)
1	883 N. Roof	1.0	0.2	2.2	20
2	883 N. Roof	2.0	0.2	4.8	20
3	883 N. Roof	1.0	0.2	2.2	20
4	883 N. Roof	0.0	0.2	-0.5	20
5	883 N. Roof	0.0	0.2	-0.5	20
6	883 N. Roof	0.0	0.2	-0.5	20
7	883 N. Roof	0.0	0.2	-0.5	20
8	883 N. Roof	0.0	0.2	-0.5	20
9	883 N. Roof	0.0	0.2	-0.5	20
10	883 N. Roof	0.0	0.2	-0.5	20
11	883 N. Roof	1.0	0.2	2.2	20
12	883 N. Roof	0.0	0.2	-0.5	20
13	883 N. Roof	0.0	0.2	-0.5	20
14	883 N. Roof	0.0	0.2	-0.5	20
15	883 N. Roof	2.0	0.2	4.8	20



114
117

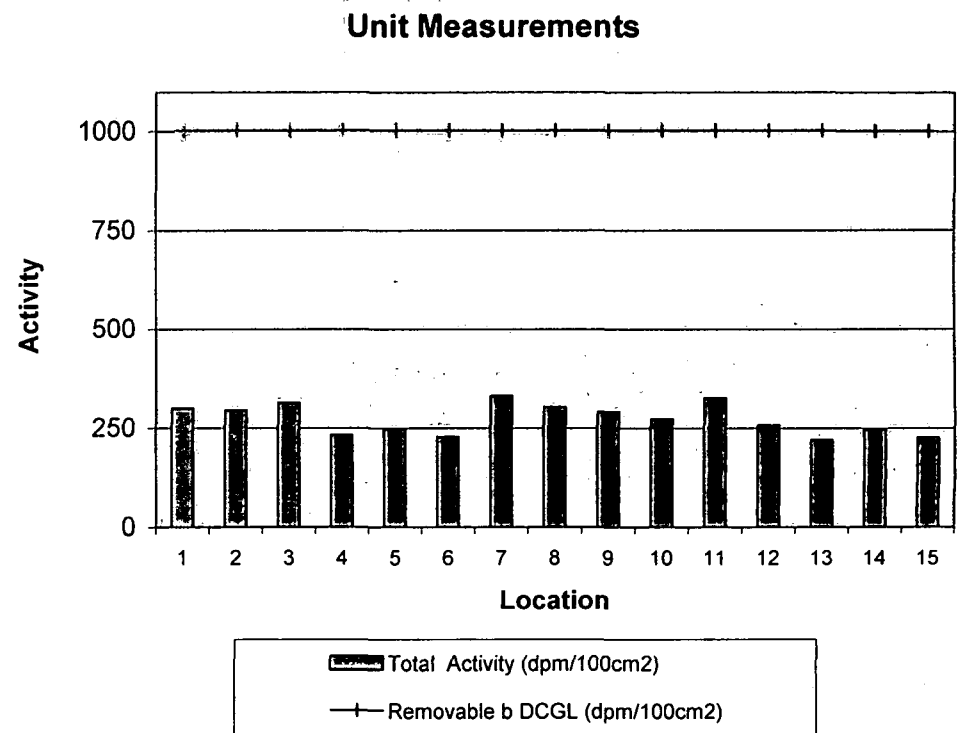
Removable Activity - Beta-Gamma

883004

7/16/01

			Instrument: <u>155596</u>	
standard deviation:	38.5	max:	330.8	Ave. Instrument background: 102.0 cpm
mean:	272.4	min:	219.7	Instrument efficiency: 39.6%
median:	272.7	Instrument MDA: 69 dpm		

	Surface Location	Total Counts (cpm/100cm ²)	Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Removable β DCGL (dpm/100cm ²)
1	883 N. Roof	221.0	102.0	300.5	1000
2	883 N. Roof	219.0	102.0	295.5	1000
3	883 N. Roof	226.0	102.0	313.1	1000
4	883 N. Roof	194.0	102.0	232.3	1000
5	883 N. Roof	200.0	102.0	247.5	1000
6	883 N. Roof	192.0	102.0	227.3	1000
7	883 N. Roof	233.0	102.0	330.8	1000
8	883 N. Roof	222.0	102.0	303.0	1000
9	883 N. Roof	217.0	102.0	290.4	1000
10	883 N. Roof	210.0	102.0	272.7	1000
11	883 N. Roof	231.0	102.0	325.8	1000
12	883 N. Roof	204.0	102.0	257.6	1000
13	883 N. Roof	189.0	102.0	219.7	1000
14	883 N. Roof	199.0	102.0	244.9	1000
15	883 N. Roof	191.0	102.0	224.7	1000



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RADIOLOGICAL CLOSEOUT SURVEY FOR

Survey Area: 883004

Survey Unit: 883004

Classification: 3

Building: 883

Survey Unit Description: Exterior Main Building Roof (center)

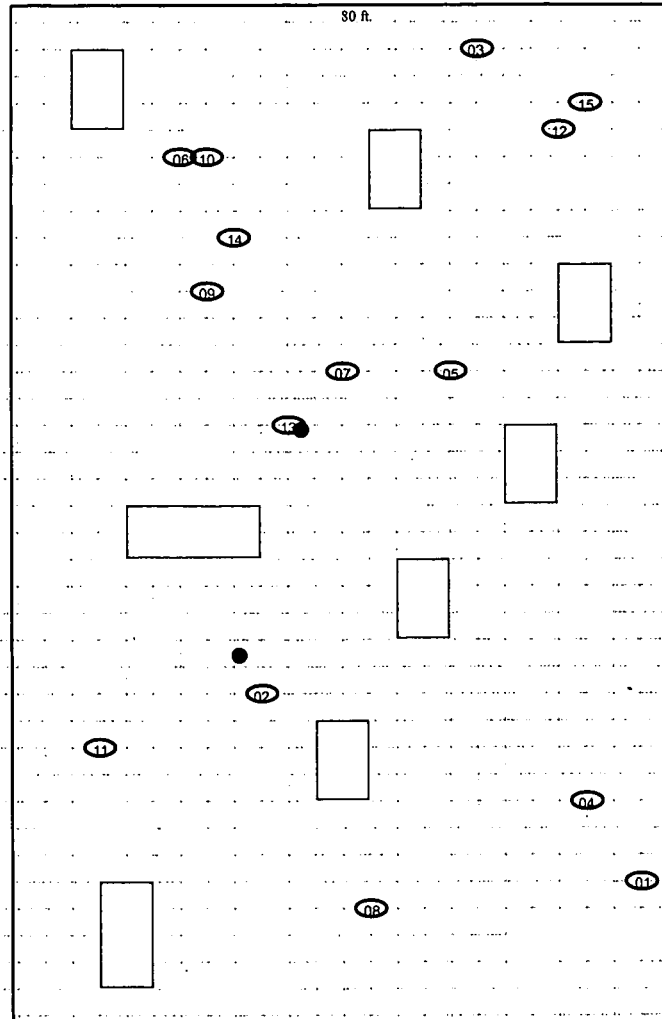
Total Floor Area: NA

Total Area: 921 sq. m

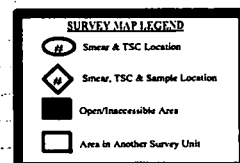
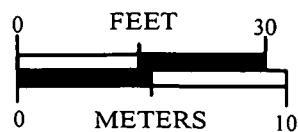
Grid Size: N/A

SURVEY UNIT 883004 - MAP 1 OF 1

Center Roof



Scan Area



119
H6

TSA Alpha

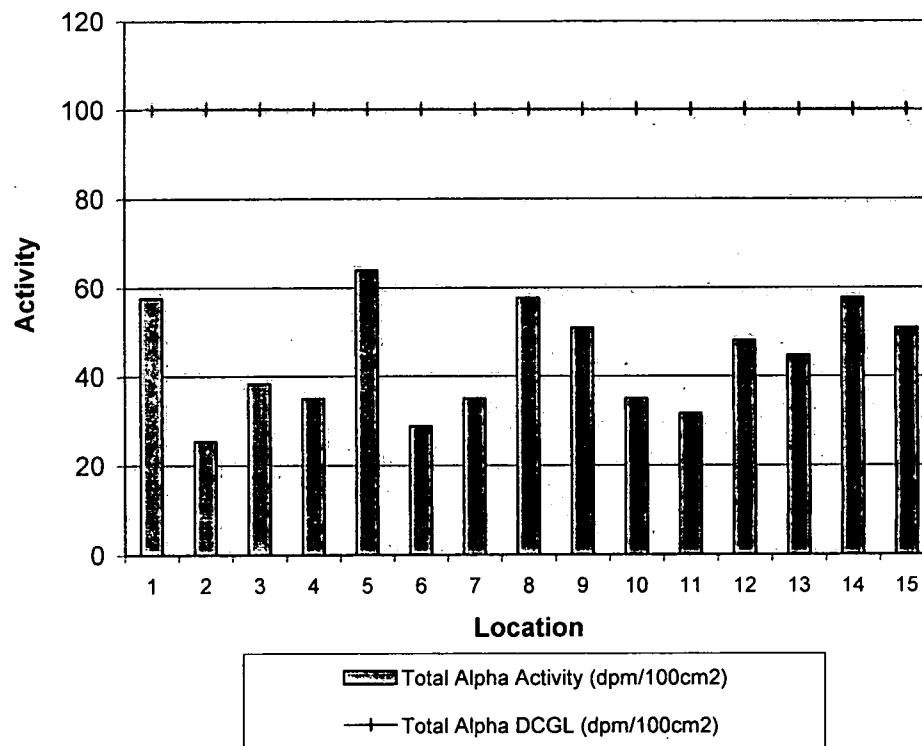
883005

7/17/01

				Instrument	<u>1366</u>	<u>1682</u> QA Instrument
standard deviation:	12.1	max:	63.9	Ave. Instrument background:	2.7 cpm	2.4 cpm
mean:	44.0	min:	25.4	Instrument efficiency:	20.8%	22.00%
median:	44.6			Instrument MDA:	48 dpm	48 dpm

	Surface Location	Total Alpha Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Alpha Activity (dpm/100cm ²)	Total Alpha DCGL (dpm/100cm ²)
1	883 west facing wall	14.7	2.0	57.6	100
2	883 west facing wall	8.0	3.3	25.4	100
3	883 west facing wall	10.7	2.0	38.4	100
4	883 west facing wall	10.0	2.0	35.0	100
5	883 west facing wall	16.0	2.7	63.9	100
6	883 west facing wall	8.7	1.3	28.8	100
7	883 west facing wall	10.0	0.7	35.0	100
8	883 west facing wall	14.7	4.0	57.6	100
9	883 west facing wall	13.3	2.7	50.9	100
10	883 west facing wall	10.0	3.3	35.0	100
11	883 west facing wall	9.3	2.0	31.7	100
12	883 west facing wall	12.7	4.0	48.0	100
13	883 west facing wall	12.0	3.3	44.6	100
14	883 west facing wall	14.7	4.7	57.6	100
15	883 west facing wall	13.3	2.7	50.9	100
3 QC	883 west facing wall	10.7	2.7	38.0	100
14 QC	883 west facing wall	10.7	2.0	38.0	100

Unit Measurements



7/20

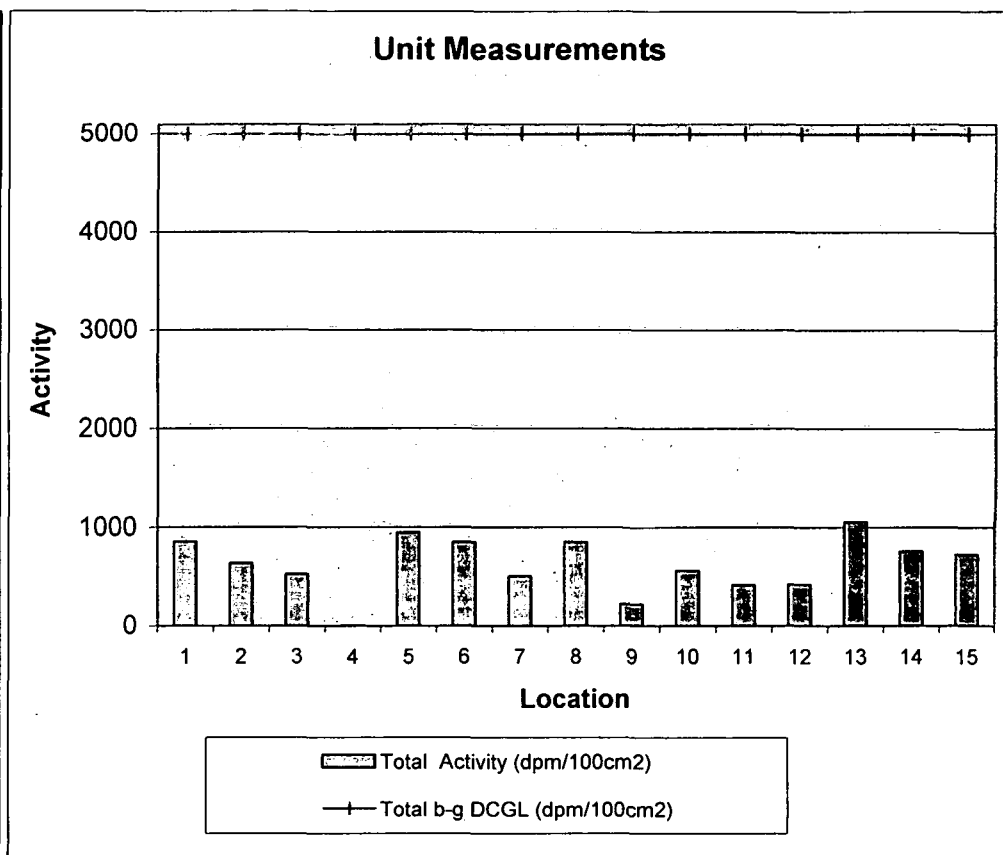
TSA Beta-Gamma

883005

7/17/01

			Instrument	<u>1366</u>	<u>1682</u> QA Instrument	
standard deviation:	284.9	max:	1053.9	Ave. Instrument background:	473.6 cpm	483.5 cpm
mean:	621.3	min:	4.3	Instrument efficiency:	32.3%	30.20%
median:	632.8			Instrument MDA:	252 dpm	280 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Total β - γ DCGL (dpm/100cm ²)
1	883 west facing wall	751.0	513.0	858.8	5000
2	883 west facing wall	678.0	406.0	632.8	5000
3	883 west facing wall	643.0	473.0	524.5	5000
4	883 west facing wall	475.0	471.0	4.3	5000
5	883 west facing wall	779.0	489.0	945.5	5000
6	883 west facing wall	749.0	511.0	852.6	5000
7	883 west facing wall	636.0	457.0	502.8	5000
8	883 west facing wall	748.0	487.0	849.5	5000
9	883 west facing wall	545.0	464.0	221.1	5000
10	883 west facing wall	654.0	462.0	558.5	5000
11	883 west facing wall	607.0	462.0	413.0	5000
12	883 west facing wall	609.0	482.0	419.2	5000
13	883 west facing wall	814.0	476.0	1053.9	5000
14	883 west facing wall	718.0	486.0	756.7	5000
15	883 west facing wall	708.0	465.0	725.7	5000
3 QC	883 west facing wall	676.0	486.0	637.4	5000
14 QC	883 west facing wall	747.0	481.0	872.5	5000



12/1/01

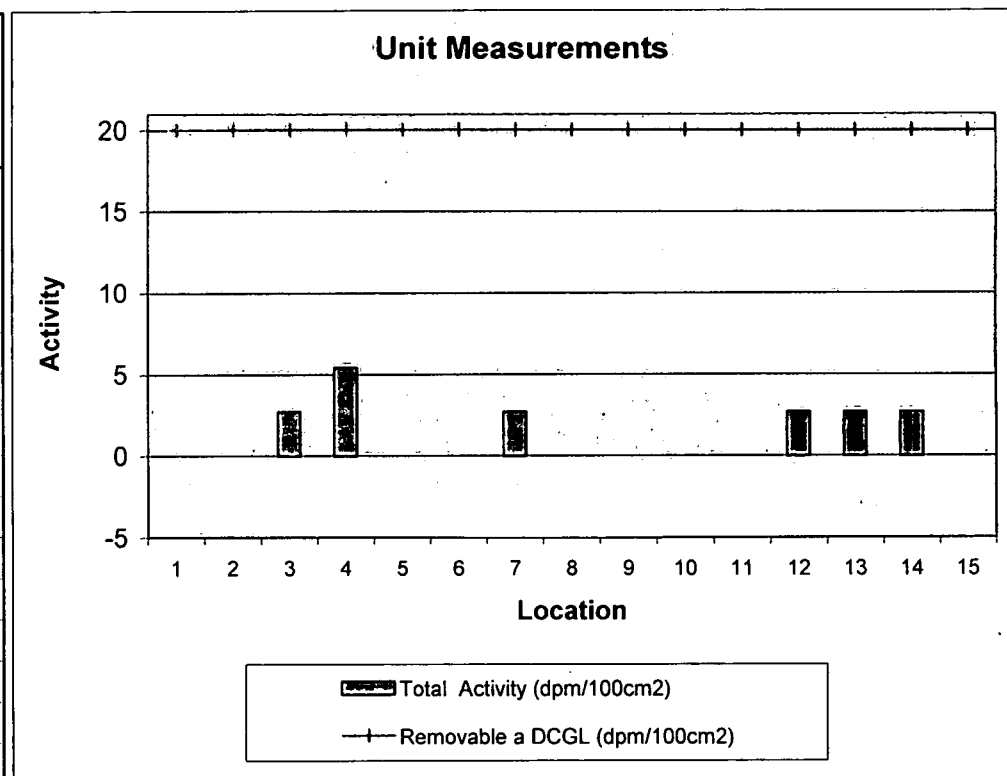
Removable Activity - Alpha

883005

7/17/01

			Instrument: <u>155596</u>	
standard deviation:	1.7	max:	5.4	Ave. Instrument background: 0.0 cpm
mean:	1.3	min:	0.0	Instrument efficiency: 37.2%
median:	0.0	Instrument MDA: 4 dpm		

	Surface Location	Total Counts (cpm/100cm ²)	Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Removable α DCGL (dpm/100cm ²)
1	883 west facing wall	0.0	0.0	0.0	20
2	883 west facing wall	0.0	0.0	0.0	20
3	883 west facing wall	1.0	0.0	2.7	20
4	883 west facing wall	2.0	0.0	5.4	20
5	883 west facing wall	0.0	0.0	0.0	20
6	883 west facing wall	0.0	0.0	0.0	20
7	883 west facing wall	1.0	0.0	2.7	20
8	883 west facing wall	0.0	0.0	0.0	20
9	883 west facing wall	0.0	0.0	0.0	20
10	883 west facing wall	0.0	0.0	0.0	20
11	883 west facing wall	0.0	0.0	0.0	20
12	883 west facing wall	1.0	0.0	2.7	20
13	883 west facing wall	1.0	0.0	2.7	20
14	883 west facing wall	1.0	0.0	2.7	20
15	883 west facing wall	0.0	0.0	0.0	20



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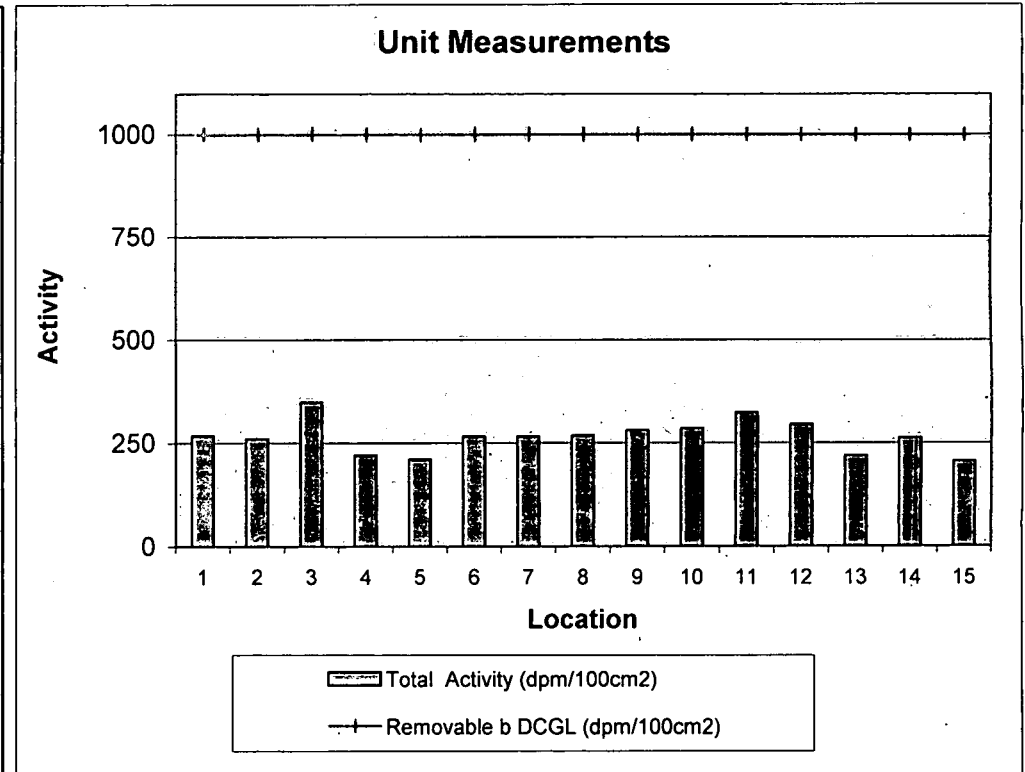
Removable Activity - Beta-Gamma

883005

7/17/01

			Instrument: 155596	
standard deviation:	40.1	max:	348.5	Ave. Instrument background: 100.0 cpm
mean:	265.2	min:	207.1	Instrument efficiency: 39.6%
median:	265.2	Instrument MDA: 68 dpm		

	Surface Location	Total Counts (cpm/100cm ²)	Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Removable β DCGL (dpm/100cm ²)
1	883 west facing wall	206.0	100.0	267.7	1000
2	883 west facing wall	203.0	100.0	260.1	1000
3	883 west facing wall	238.0	100.0	348.5	1000
4	883 west facing wall	187.0	100.0	219.7	1000
5	883 west facing wall	183.0	100.0	209.6	1000
6	883 west facing wall	205.0	100.0	265.2	1000
7	883 west facing wall	205.0	100.0	265.2	1000
8	883 west facing wall	206.0	100.0	267.7	1000
9	883 west facing wall	211.0	100.0	280.3	1000
10	883 west facing wall	213.0	100.0	285.4	1000
11	883 west facing wall	228.0	100.0	323.2	1000
12	883 west facing wall	217.0	100.0	295.5	1000
13	883 west facing wall	187.0	100.0	219.7	1000
14	883 west facing wall	204.0	100.0	262.6	1000
15	883 west facing wall	182.0	100.0	207.1	1000



1230

RADIOLOGICAL CLOSEOUT SURVEY FOR

Survey Area: 883005

Survey Unit: 883005

Classification: 3

Building: 883

Survey Unit Description: Exterior Main Building Roof (south)

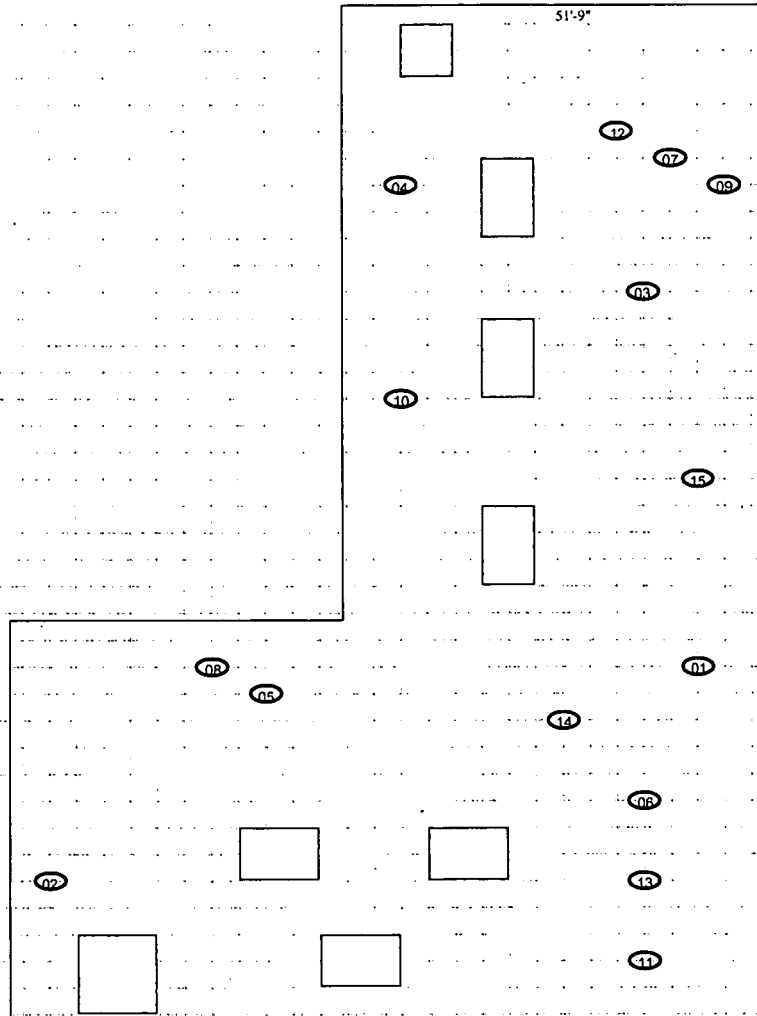
Total Floor Area: NA


Total Area: 778 sq. m

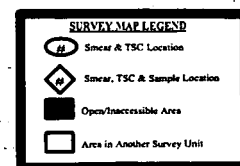
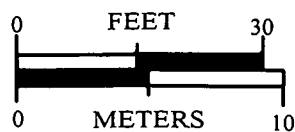
Grid Size: N/A

SURVEY UNIT 883005 - MAP 1 OF 1

South end Roof



Scan Area 



TSA Alpha

883006

7/27/01

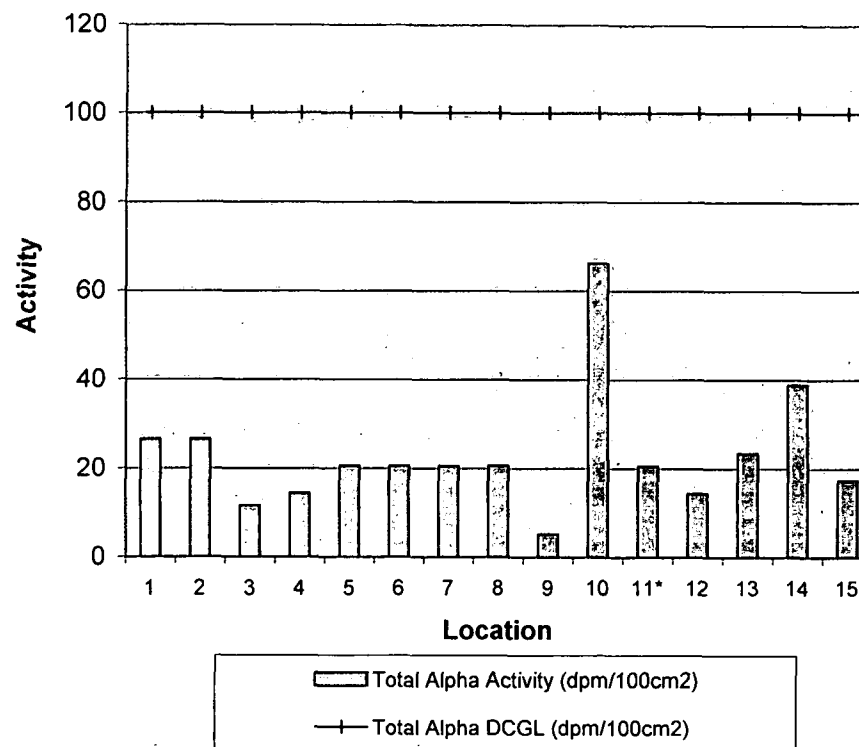
standard deviation: 14.2 max: 66.2
 mean: 23.1 min: 5.1
 median: 20.6

Instrument 3114 1420 394 QA
 Ave. Instrument background: 2.2 cpm 2.2 cpm 2.0 cpm
 Instrument efficiency: 22.0% 21.95% 21.80%
 Instrument MDA: 48 dpm 48 dpm 48 dpm

	Surface Location	Total Alpha Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Alpha Activity (dpm/100cm ²)	Total Alpha DCGL (dpm/100cm ²)
1	879 & T883D exteriors.	8.0	3.3	26.5	100
2	879 & T883D exteriors.	8.0	2.0	26.5	100
3	879 & T883D exteriors.	4.7	0.0	11.5	100
4	879 & T883D exteriors.	5.3	0.7	14.2	100
5	879 & T883D exteriors.	6.7	1.3	20.6	100
6	879 & T883D exteriors.	6.7	2.0	20.6	100
7	879 & T883D exteriors.	6.7	6.0	20.6	100
8	879 & T883D exteriors.	6.7	1.3	20.6	100
9	879 & T883D exteriors.	3.3	2.0	5.1	100
10	879 & T883D exteriors.	16.7	4.0	66.2	100
11*	879 & T883D exteriors.	6.7	2.0	20.6	100
12	879 & T883D exteriors.	5.3	2.0	14.2	100
13	879 & T883D exteriors.	7.3	2.0	23.4	100
14	879 & T883D exteriors.	10.7	2.7	38.8	100
15	879 & T883D exteriors.	6.0	1.3	17.4	100
15 QC	879 & T883D exteriors.	8.0	0.7	26.5	100
6 QC	879 & T883D exteriors.	5.3	3.3	14.2	100

* Location 11 is a recount following a 24 hour decay period.

Unit Measurements



122
125

TSA Beta-Gamma

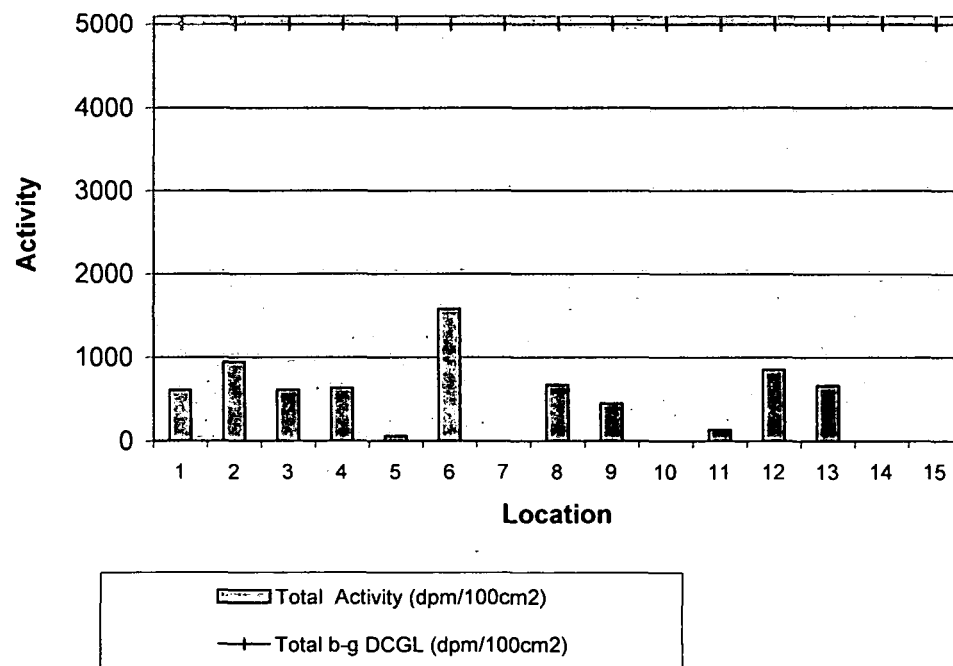
883006

7/27/01

				Instrument	<u>3114</u>	<u>1420</u>	<u>394</u> QA
standard deviation:	525.2	max:	1582.7	Ave. Instrument background:	556.2 cpm	556.2 cpm	718.0 cpm
mean:	429.4	min:	-405.4	Instrument efficiency:	32.4%	33.35%	28.50%
median:	608.1			Instrument MDA:	255 dpm	225 dpm	258 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Total β-γ DCGL (dpm/100cm ²)
1	879 & T883D exteriors.	759.0	546.0	608.1	5000
2	879 & T883D exteriors.	871.0	591.0	943.9	5000
3	879 & T883D exteriors.	761.0	527.0	614.1	5000
4	879 & T883D exteriors.	769.0	473.0	638.1	5000
5	879 & T883D exteriors.	575.0	591.0	58.0	5000
6	879 & T883D exteriors.	1069.0	1105.0	1582.7	5000
7	879 & T883D exteriors.	491.0	463.0	-201.2	5000
8	879 & T883D exteriors.	782.0	536.0	677.1	5000
9	879 & T883D exteriors.	706.0	540.0	449.2	5000
10	879 & T883D exteriors.	421.0	403.0	-405.4	5000
11	879 & T883D exteriors.	601.0	544.0	138.3	5000
12	879 & T883D exteriors.	841.0	519.0	854.0	5000
13	879 & T883D exteriors.	778.0	504.0	665.1	5000
14	879 & T883D exteriors.	534.0	478.0	-66.6	5000
15	879 & T883D exteriors.	519.0	523.0	-114.8	5000
15 QC	879 & T883D exteriors.	419.0	459.0	-411.4	5000
6 QC	879 & T883D exteriors.	844.0	977.0	863.0	5000

Unit Measurements



723
126

Removable Activity - Alpha

883006

7/27/01

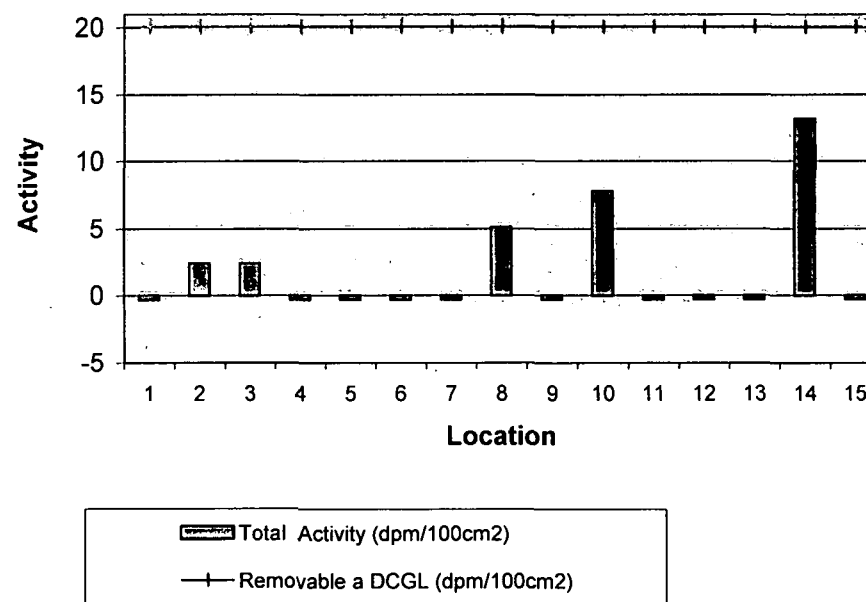
standard deviation: 4.0
mean: 1.9
median: -0.3

max: 13.2
min: -0.3

Instrument: 155596
Ave. Instrument background: 0.1 cpm
Instrument efficiency: 37.2%
Instrument MDA: 6.2 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Removable α DCGL (dpm/100cm ²)
1	879 & T883D exteriors.	0.0	0.1	-0.3	20
2	879 & T883D exteriors.	1.0	0.1	2.4	20
3	879 & T883D exteriors.	1.0	0.1	2.4	20
4	879 & T883D exteriors.	0.0	0.1	-0.3	20
5	879 & T883D exteriors.	0.0	0.1	-0.3	20
6	879 & T883D exteriors.	0.0	0.1	-0.3	20
7	879 & T883D exteriors.	0.0	0.1	-0.3	20
8	879 & T883D exteriors.	2.0	0.1	5.1	20
9	879 & T883D exteriors.	0.0	0.1	-0.3	20
10	879 & T883D exteriors.	3.0	0.1	7.8	20
11	879 & T883D exteriors.	0.0	0.1	-0.3	20
12	879 & T883D exteriors.	0.0	0.1	-0.3	20
13	879 & T883D exteriors.	0.0	0.1	-0.3	20
14	879 & T883D exteriors.	5.0	0.1	13.2	20
15	879 & T883D exteriors.	0.0	0.1	-0.3	20

Unit Measurements



724
127

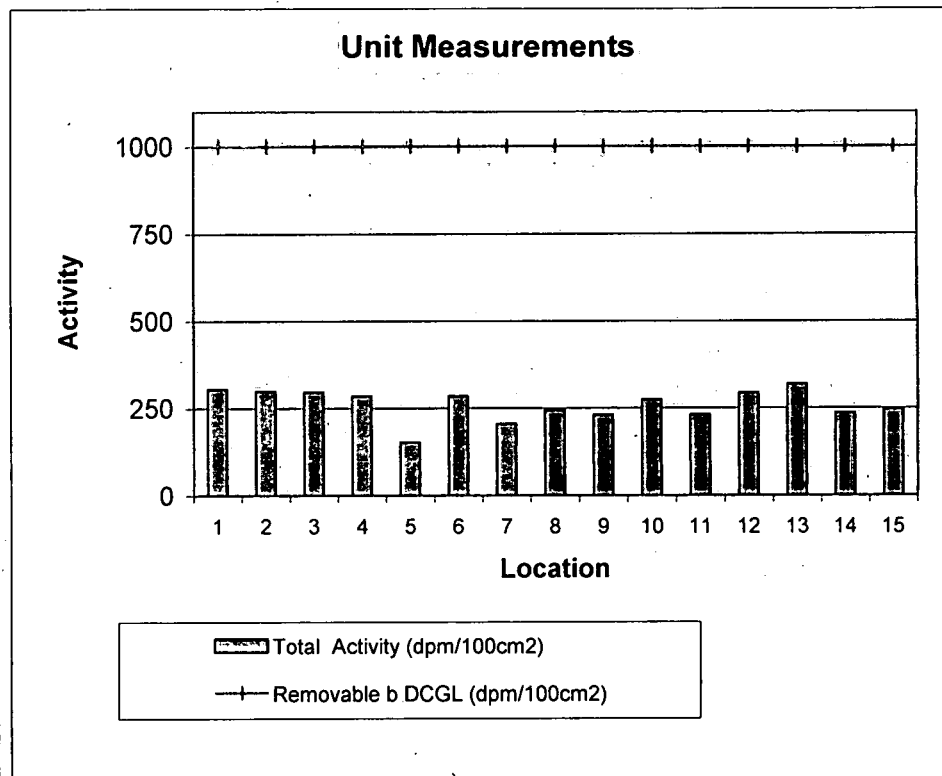
Removable Activity - Beta-Gamma

883006

7/27/01

			Instrument: 155596	
standard deviation:	44.8	max:	319.2	Ave. Instrument background: 86.6 cpm
mean:	259.9	min:	152.5	Instrument efficiency: 39.6%
median:	273.7	Instrument MDA: 64 dpm		

	Surface Location	Total Counts (cpm/100cm ²)	Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Removable β DCGL (dpm/100cm ²)
1	879 & T883D exteriors.	207.0	86.6	304.0	1000
2	879 & T883D exteriors.	205.0	86.6	299.0	1000
3	879 & T883D exteriors.	204.0	86.6	296.5	1000
4	879 & T883D exteriors.	199.0	86.6	283.8	1000
5	879 & T883D exteriors.	147.0	86.6	152.5	1000
6	879 & T883D exteriors.	199.0	86.6	283.8	1000
7	879 & T883D exteriors.	168.0	86.6	205.6	1000
8	879 & T883D exteriors.	183.0	86.6	243.4	1000
9	879 & T883D exteriors.	178.0	86.6	230.8	1000
10	879 & T883D exteriors.	195.0	86.6	273.7	1000
11	879 & T883D exteriors.	178.0	86.6	230.8	1000
12	879 & T883D exteriors.	203.0	86.6	293.9	1000
13	879 & T883D exteriors.	213.0	86.6	319.2	1000
14	879 & T883D exteriors.	180.0	86.6	235.9	1000
15	879 & T883D exteriors.	184.0	86.6	246.0	1000



RADIOLOGICAL CLOSEOUT SURVEY FOR

Survey Area: 883006

Survey Unit: 883006

Classification: 3

Building: 879, T883D

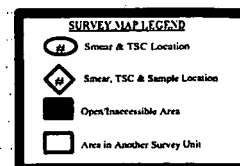
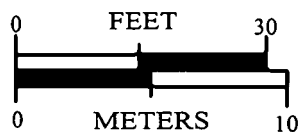
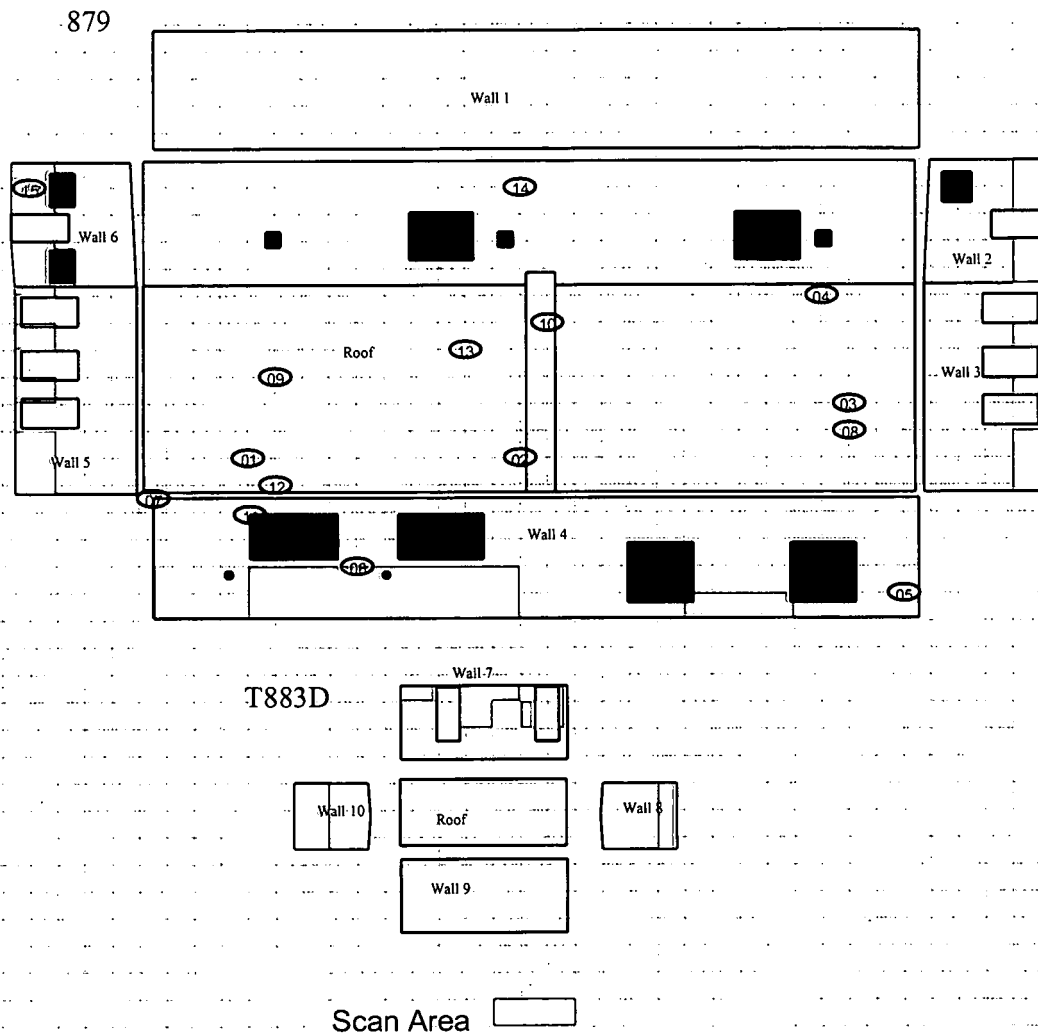
Survey Unit Description: Exterior

Total Floor Area: NA

Total Area: 722 sq. m

Grid Size: N/A

SURVEY UNIT 883006 - MAP 1 OF 1



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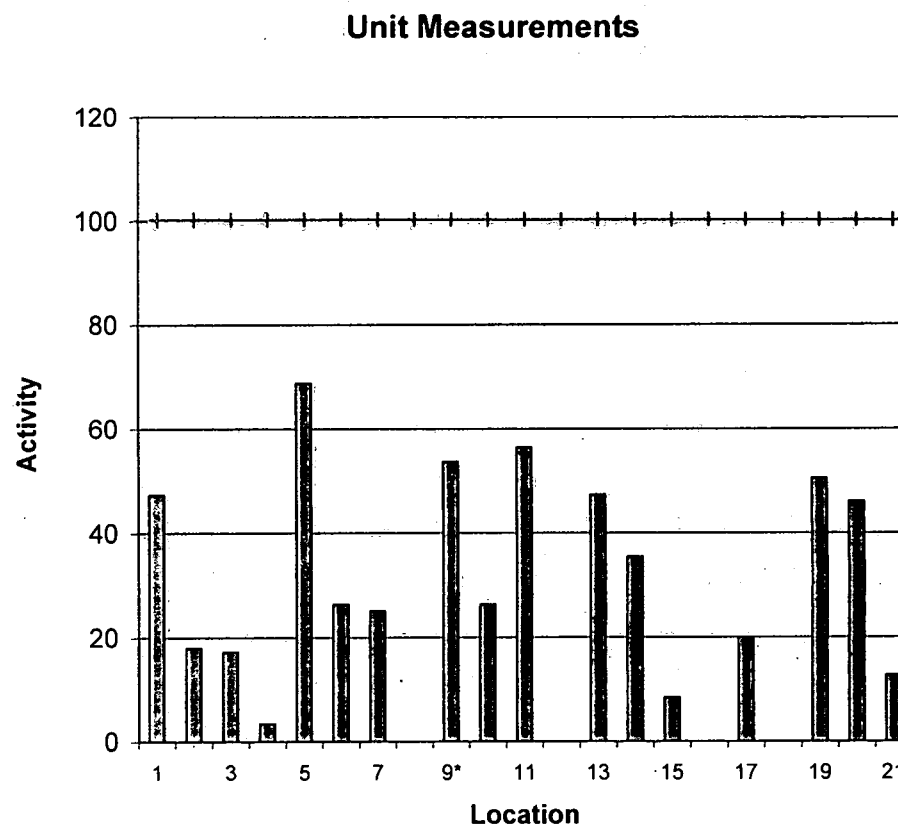
TSA Alpha

883007

8/8/01

					1	2	3	4	5	6
				Instrument:	3114	1665	3114	394 QC	3114	3114
std. Dev.:	23.0	max:	68.5	Ave. Inst. background:	2.9	2.9	2.9	4.6 cpm	2.9	2.9 cpm
mean:	26.7	min:	-5.7	Instrument efficiency:	22.00%	21.16%	22.00%	21.80%	22.00%	22.00%
median:	25.6			Instrument MDA:	48	48	48	48 dpm	48	48 dpm

	Surface Location	Total Alpha Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Alpha Activity (dpm/100cm ²)	Total Alpha DCGL (dpm/100cm ²)
1	883 N&S facing walls.	13.3	3.3	47.2	100
2	883 N&S facing walls.	6.7	2.7	17.9	100
3	883 N&S facing walls.	6.7	3.3	17.2	100
4	883 N&S facing walls.	5.3	4.0	3.4	100
5	883 N&S facing walls.	18.0	3.3	68.5	100
6	883 N&S facing walls.	8.7	2.7	26.3	100
7	883 N&S facing walls.	10.0	4.0	25.0	100
8	883 N&S facing walls.	2.7	0.7	-1.0	100
9*	883 N&S facing walls.	14.7	0.7	53.5	100
10	883 N&S facing walls.	8.7	2.7	26.3	100
11	883 N&S facing walls.	15.3	1.3	56.3	100
12	883 N&S facing walls.	2.0	2.7	-4.3	100
13	883 N&S facing walls.	13.3	7.3	47.2	100
14	883 N&S facing walls.	10.7	3.3	35.4	100
15	883 N&S facing walls.	4.7	2.7	8.4	100
16	883 N&S facing walls.	2.0	2.0	-4.2	100
17	883 N&S facing walls.	7.3	1.3	19.9	100
18	883 N&S facing walls.	3.3	3.3	-5.7	100
19	883 N&S facing walls.	14.0	4.7	50.4	100
20*	883 N&S facing walls.	13.0	0.0	45.8	100
21	883 N&S facing walls.	7.3	5.3	12.6	100
12 QC	883 N&S facing walls.	4.7	8.0	0.7	100
2 QC	883 N&S facing walls.	7.3	2.7	12.6	100



* Locations 9 and 20 are recounts following a 24 hour decay period.

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TSA Beta-Gamma

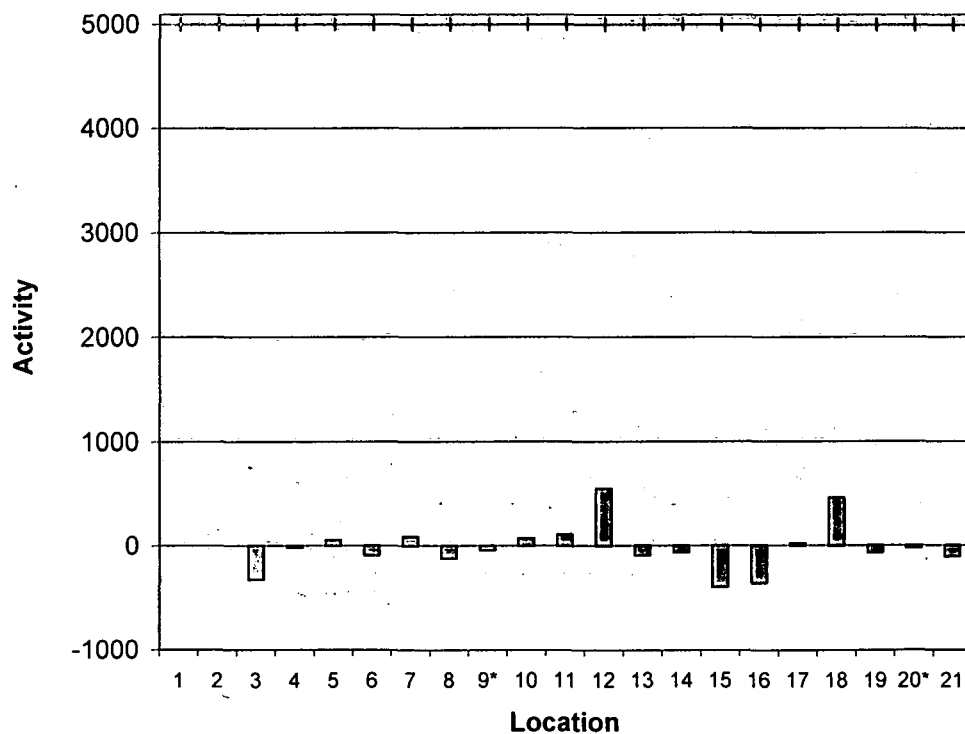
883007

8/8/01

				1	2	3	4	5	6		
				Instrument:	<u>3114</u>	<u>1665</u>	<u>3114</u>	<u>394</u> QC	<u>3114</u>	<u>3114</u>	
std. Dev.:	225.7	max:	549.3	Ave. Inst. background:	420.6	420.6	420.6	457.7 cpm	420.6	420.6 cpm	
mean:	-11.6	min:	-398.0	Instrument efficiency:	32.40%	32.30%	32.40%	28.50%	32.40%	32.40%	
median:	-16.8	Instrument MDA:				48	48	48	48 dpm	48	48 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Total β-γ DCGL (dpm/100cm ²)
1	883 N&S facing walls.	421	421	1.3	5000
2	883 N&S facing walls.	421	487	1.3	5000
3	883 N&S facing walls.	316	245	-322.7	5000
4	883 N&S facing walls.	453	480	-16.4	5000
5	883 N&S facing walls.	439	403	56.9	5000
6	883 N&S facing walls.	391	417	-91.3	5000
7	883 N&S facing walls.	481	464	81.9	5000
8	883 N&S facing walls.	381	405	-122.1	5000
9*	883 N&S facing walls.	408	417	-38.8	5000
10	883 N&S facing walls.	443	417	69.2	5000
11	883 N&S facing walls.	454	416	103.2	5000
12	883 N&S facing walls.	598	550	549.3	5000
13	883 N&S facing walls.	391	321	-91.3	5000
14	883 N&S facing walls.	401	415	-60.4	5000
15	883 N&S facing walls.	292	388	-398.0	5000
16	883 N&S facing walls.	305	325	-356.7	5000
17	883 N&S facing walls.	427	393	19.9	5000
18	883 N&S facing walls.	589	542	460.8	5000
19	883 N&S facing walls.	401	375	-60.4	5000
20*	883 N&S facing walls.	415	419	-17.2	5000
21	883 N&S facing walls.	430	431	-97.1	5000
12 QC	883 N&S facing walls.	430	431	-97.1	5000
2 QC	883 N&S facing walls.	560	511	359.1	5000

Unit Measurements



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Removable Activity - Alpha

883007

8/8/01

standard deviation: 1.4
mean: 0.9
median: 1.1

max: 3.8
min: -0.3

Instrument: 155596 155596

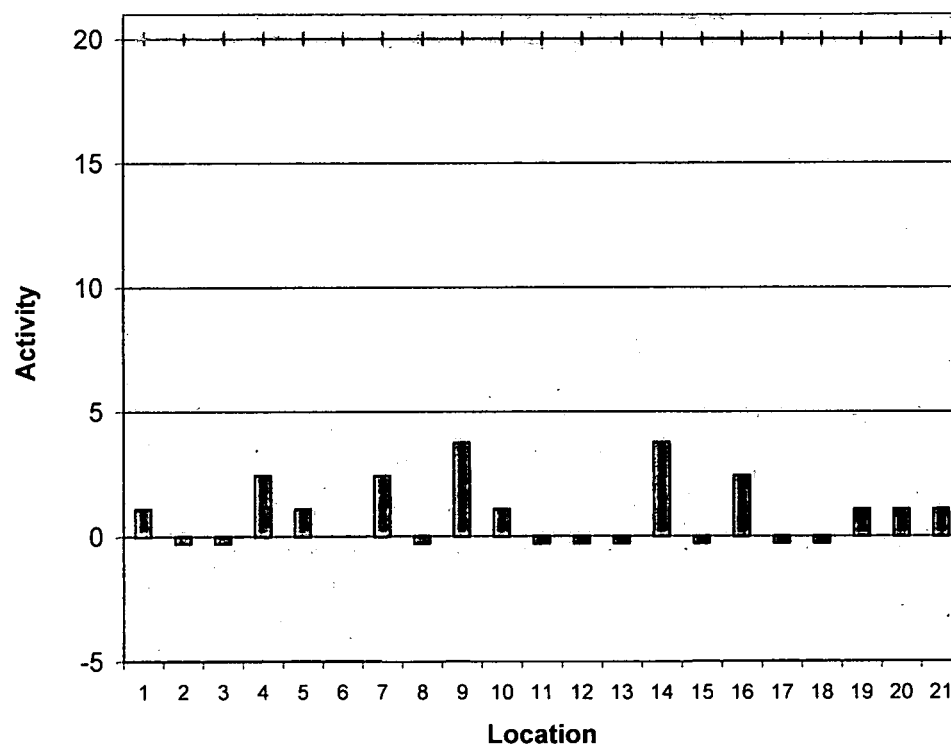
Instrument background: 0.1 0.5 cpm

Instrument efficiency: 37.2% 37.2%

Instrument MDA: 6.2 8.9 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Removable α DCGL (dpm/100cm ²)
1	883 N&S facing walls.	0.5	0.1	1.1	20
2	883 N&S facing walls.	0.0	0.1	-0.3	20
3	883 N&S facing walls.	0.0	0.1	-0.3	20
4	883 N&S facing walls.	1.0	0.1	2.4	20
5	883 N&S facing walls.	0.5	0.1	1.1	20
6	883 N&S facing walls.	0.5	0.5	0.0	20
7	883 N&S facing walls.	1.0	0.1	2.4	20
8	883 N&S facing walls.	0.0	0.1	-0.3	20
9	883 N&S facing walls.	1.5	0.1	3.8	20
10	883 N&S facing walls.	0.5	0.1	1.1	20
11	883 N&S facing walls.	0.0	0.1	-0.3	20
12	883 N&S facing walls.	0.0	0.1	-0.3	20
13	883 N&S facing walls.	0.0	0.1	-0.3	20
14	883 N&S facing walls.	1.5	0.1	3.8	20
15	883 N&S facing walls.	0.0	0.1	-0.3	20
16	883 N&S facing walls.	1.0	0.1	2.4	20
17	883 N&S facing walls.	0.0	0.1	-0.3	20
18	883 N&S facing walls.	0.0	0.1	-0.3	20
19	883 N&S facing walls.	0.5	0.1	1.1	20
20	883 N&S facing walls.	0.5	0.1	1.1	20
21	883 N&S facing walls.	0.5	0.1	1.1	20

Unit Measurements



█ Total Activity (dpm/100cm²)
—+— Removable α DCGL (dpm/100cm²)

129
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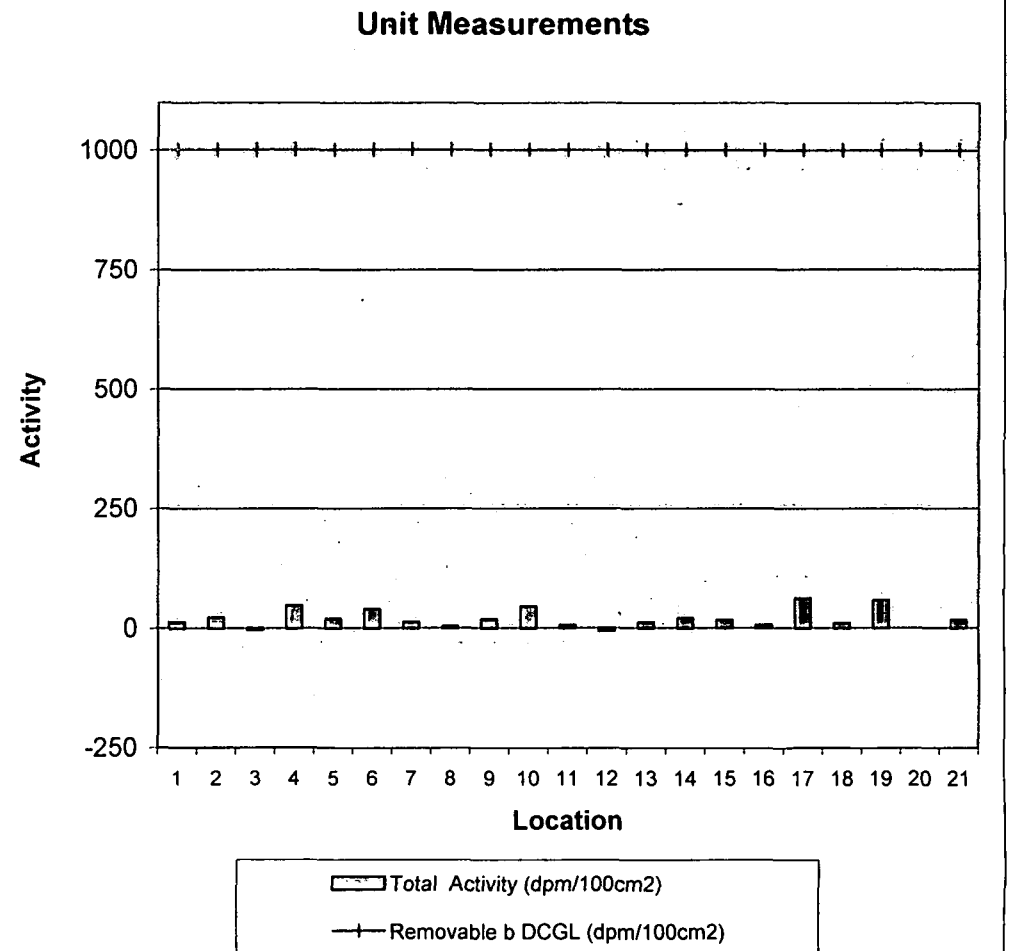
Removable Activity - Beta-Gamma

883007

8/8/01

				Instrument:	1 155596	2 155596
standard deviation:	19.3	max:	61.6	Instrument background:	86.6	93.0 cpm
mean:	19.7	min:	-5.3	Instrument efficiency:	39.6%	39.6%
median:	16.2			Instrument MDA:	63.7	65.9 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Removable β DCGL (dpm/100cm ²)
1	883 N&S facing walls.	91.0	86.6	11.1	1000
2	883 N&S facing walls.	95.0	86.6	21.2	1000
3	883 N&S facing walls.	85.5	86.6	-2.8	1000
4	883 N&S facing walls.	105.0	86.6	46.5	1000
5	883 N&S facing walls.	94.0	86.6	18.7	1000
6	883 N&S facing walls.	108.5	93.0	39.1	1000
7	883 N&S facing walls.	91.5	86.6	12.4	1000
8	883 N&S facing walls.	88.0	86.6	3.5	1000
9	883 N&S facing walls.	93.5	86.6	17.4	1000
10	883 N&S facing walls.	104.5	86.6	45.2	1000
11	883 N&S facing walls.	89.0	86.6	6.1	1000
12	883 N&S facing walls.	84.5	86.6	-5.3	1000
13	883 N&S facing walls.	91.0	86.6	11.1	1000
14	883 N&S facing walls.	94.5	86.6	19.9	1000
15	883 N&S facing walls.	93.0	86.6	16.2	1000
16	883 N&S facing walls.	89.0	86.6	6.1	1000
17	883 N&S facing walls.	111.0	86.6	61.6	1000
18	883 N&S facing walls.	90.5	86.6	9.8	1000
19	883 N&S facing walls.	109.5	86.6	57.8	1000
20	883 N&S facing walls.	86.5	86.6	-0.3	1000
21	883 N&S facing walls.	93.5	86.6	17.4	1000



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RADIOLOGICAL CLOSEOUT SURVEY FOR

Survey Area: 883007

Survey Unit: 883007

Classification: 3

Building: 883

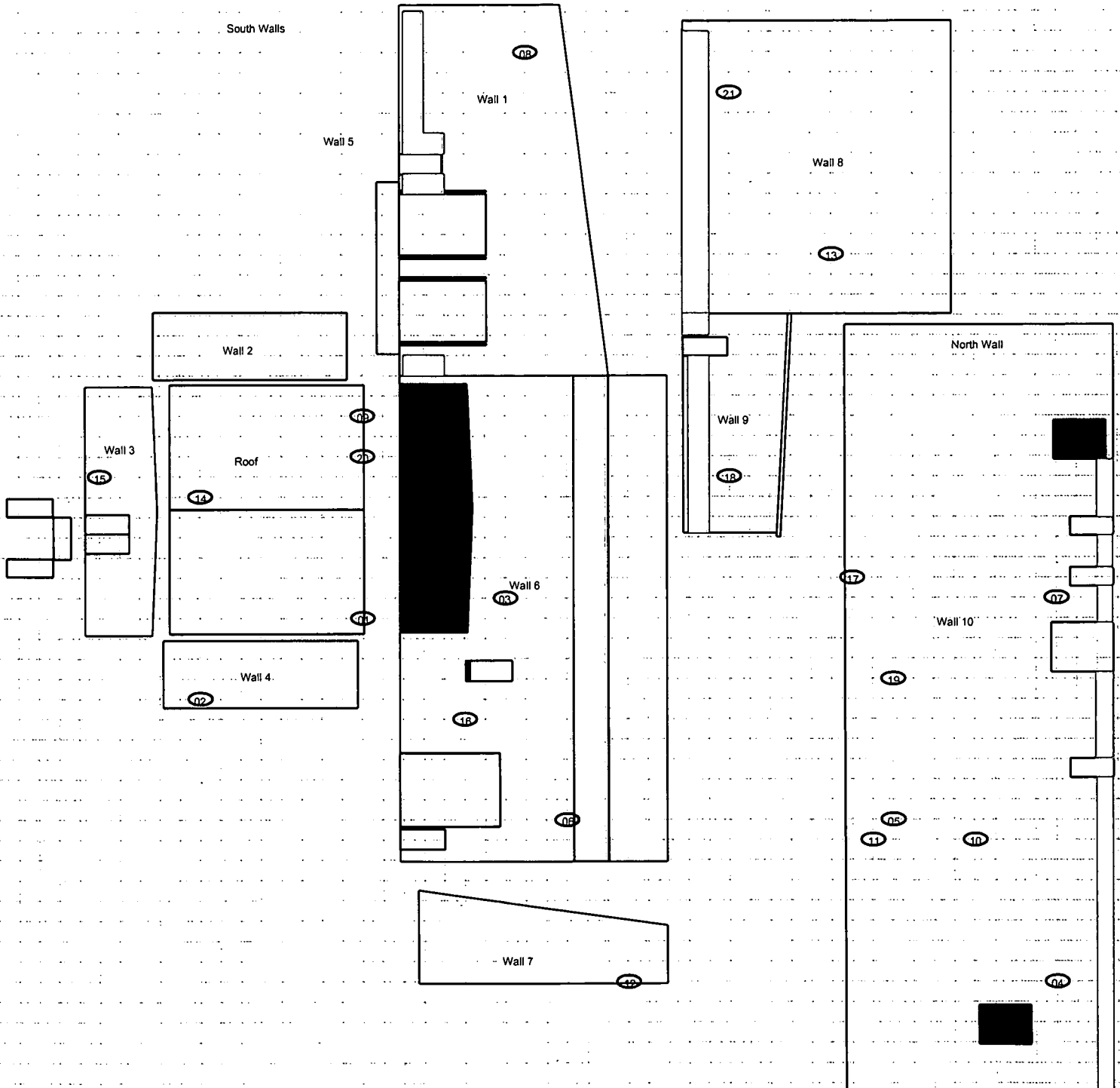
Survey Unit Description: Exterior South/North Walls

Total Floor Area: NA

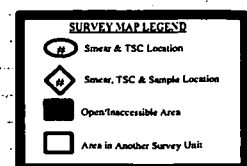
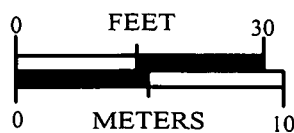
Total Area: 1403 sq. m

Grid Size: N/A

SURVEY UNIT 883007 - MAP 1 OF 1



Scanned Areas



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TSA Alpha

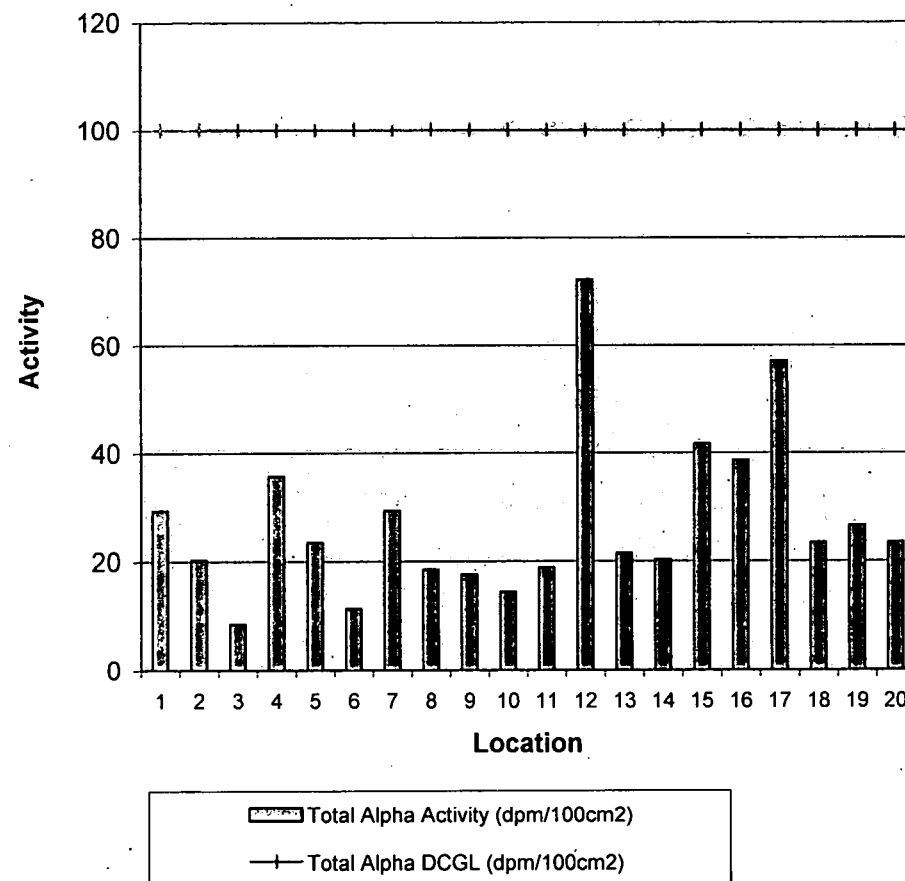
883008

8/8/01

					1	2	3	4		5	6	7
			Instrument:		3114	1682	1366	394 QC		3114	1420	3114
std. Dev.:	15.4	max:	72.1	Ave. Inst. background:	2.8	2.8	2.8	3.4 cpm		2.8	2.8	2.8 cpm
mean:	27.6	min:	8.5	Instrument efficiency:	22.00%	22.00%	20.80%	21.80%		22.00%	21.95%	22.00%
median:	23.5			Instrument MDA:	48	48	48	48 dpm		48	48	48 dpm

	Surface Location	Total Alpha Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Alpha Activity (dpm/100cm ²)	Total Alpha DCGL (dpm/100cm ²)
1	883 east facing walls.	9.3	3.3	29.4	100
2	883 east facing walls.	7.3	2.0	20.3	100
3	883 east facing walls.	4.7	2.0	8.5	100
4	883 east facing walls.	10.7	6.0	35.7	100
5	883 east facing walls.	8.0	1.3	23.5	100
6	883 east facing walls.	5.3	4.7	11.2	100
7	883 east facing walls.	9.3	2.7	29.4	100
8	883 east facing walls.	6.7	1.3	18.6	100
9	883 east facing walls.	6.7	1.3	17.6	100
10	883 east facing walls.	6.0	3.3	14.4	100
11	883 east facing walls.	7.0	0.7	18.9	100
12	883 east facing walls.	18.7	2.7	72.1	100
13	883 east facing walls.	7.3	2.7	21.4	100
14	883 east facing walls.	7.3	1.3	20.3	100
15	883 east facing walls.	12.0	4.0	41.7	100
16	883 east facing walls.	11.3	3.6	38.5	100
17	883 east facing walls.	14.7	3.3	57.0	100
18	883 east facing walls.	8.0	3.3	23.5	100
19	883 east facing walls.	8.7	4.0	26.6	100
20	883 east facing walls.	8.0	3.3	23.5	100
8 QC	883 east facing walls.	8.7	4.0	24.5	100
11 QC	883 east facing walls.	8.0	2.7	21.3	100

Unit Measurements



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TSA Beta-Gamma

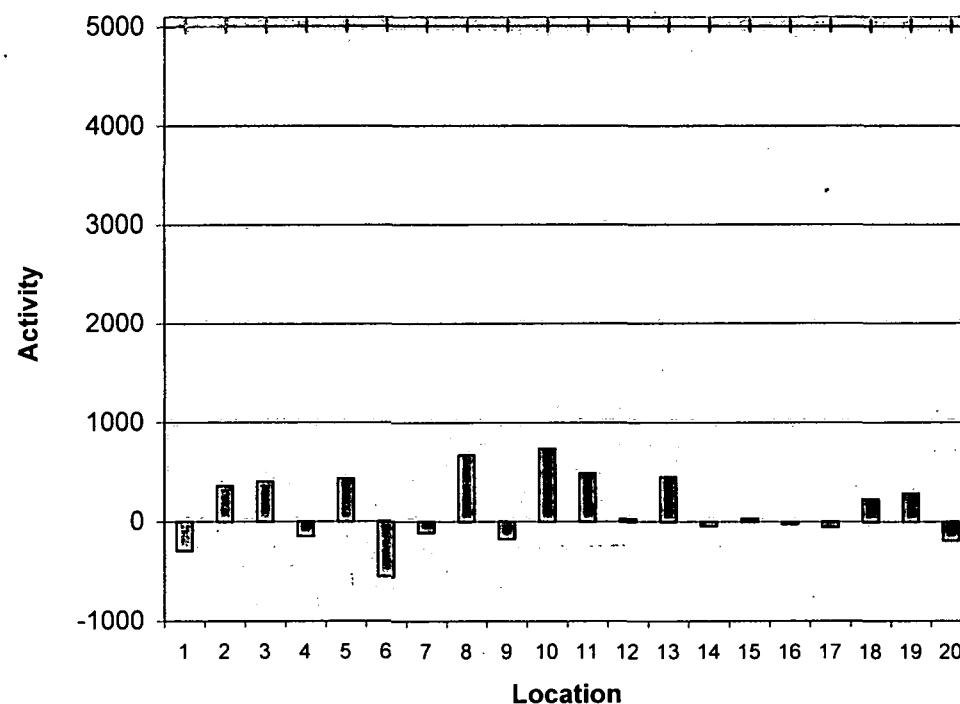
883008

8/8/01

				1	2	3	4		5	6	7
			Instrument:	3114	1682	1366	394 QC		3114	1420	3114
std. Dev.:	340.9	max:	734.1	Ave. Inst. background:	488.1	488.1	488.1	521.0 cpm	488.1	488.1	488.1 cpm
mean:	126.8	min:	-549.1	Instrument efficiency:	32.40%	30.20%	32.30%	28.50%	32.40%	33.35%	32.40%
median:	30.0			Instrument MDA:	48	48	48	48 dpm	48	48	48 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Total β - γ DCGL (dpm/100cm ²)
1	883 east facing walls.	393	338	-293.6	5000
2	883 east facing walls.	605	653	360.7	5000
3	883 east facing walls.	610	598	403.5	5000
4	883 east facing walls.	441	399	-145.5	5000
5	883 east facing walls.	628	533	431.7	5000
6	883 east facing walls.	305	253	-549.1	5000
7	883 east facing walls.	454	461	-105.4	5000
8	883 east facing walls.	705	663	671.4	5000
9	883 east facing walls.	431	359	-171.3	5000
10	883 east facing walls.	726	623	734.1	5000
11	883 east facing walls.	635	566	486.3	5000
12	883 east facing walls.	497	398	27.4	5000
13	883 east facing walls.	633	618	448.5	5000
14	883 east facing walls.	475	452	-40.5	5000
15	883 east facing walls.	499	465	32.6	5000
16	883 east facing walls.	481	416	-21.4	5000
17	883 east facing walls.	471	485	-53.1	5000
18	883 east facing walls.	561	493	224.9	5000
19	883 east facing walls.	580	567	283.5	5000
20	883 east facing walls.	425	357	-189.3	5000
8 QC	883 east facing walls.	591	532	245.6	5000
11 QC	883 east facing walls.	555	510	119.3	5000

Unit Measurements



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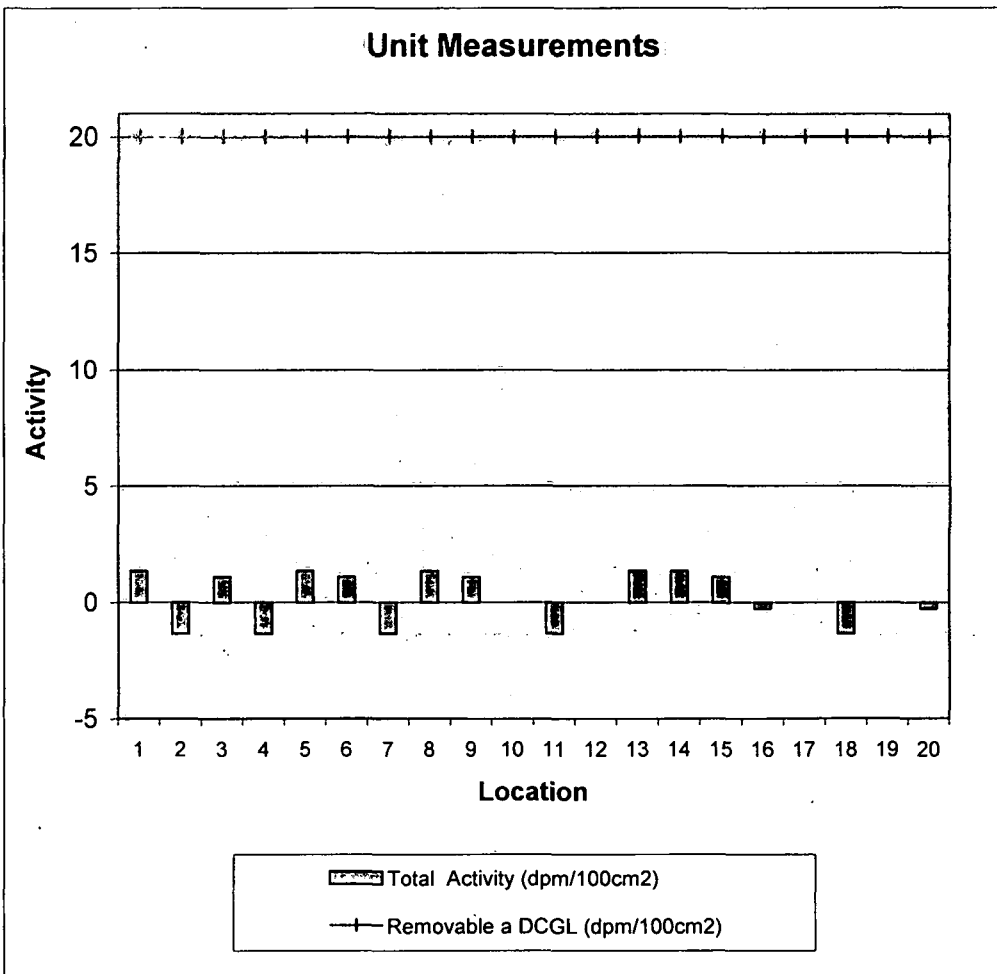
Removable Activity - Alpha

883008

8/8/01

			Instrument: 155596 155596 155596		
standard deviation:	1.1	max:	1.3	Instrument background:	0.1 0.1 0.5 cpm
mean:	0.2	min:	-1.3	Instrument efficiency:	37.2% 37.2% 37.2%
median:	0.0			Instrument MDA:	6.2 6.2 9.0 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Removable α DCGL (dpm/100cm ²)
1	883 east facing walls.	1.0	0.5	1.3	20
2	883 east facing walls.	0.0	0.5	-1.3	20
3	883 east facing walls.	0.5	0.1	1.1	20
4	883 east facing walls.	0.0	0.5	-1.3	20
5	883 east facing walls.	1.0	0.5	1.3	20
6	883 east facing walls.	0.5	0.1	1.1	20
7	883 east facing walls.	0.0	0.5	-1.3	20
8	883 east facing walls.	1.0	0.5	1.3	20
9	883 east facing walls.	0.5	0.1	1.1	20
10	883 east facing walls.	0.5	0.5	0.0	20
11	883 east facing walls.	0.0	0.5	-1.3	20
12	883 east facing walls.	0.5	0.5	0.0	20
13	883 east facing walls.	1.0	0.5	1.3	20
14	883 east facing walls.	1.0	0.5	1.3	20
15	883 east facing walls.	0.5	0.1	1.1	20
16	883 east facing walls.	0.0	0.1	-0.3	20
17	883 east facing walls.	0.5	0.5	0.0	20
18	883 east facing walls.	0.0	0.5	-1.3	20
19	883 east facing walls.	0.5	0.5	0.0	20
20	883 east facing walls.	0.0	0.1	-0.3	20



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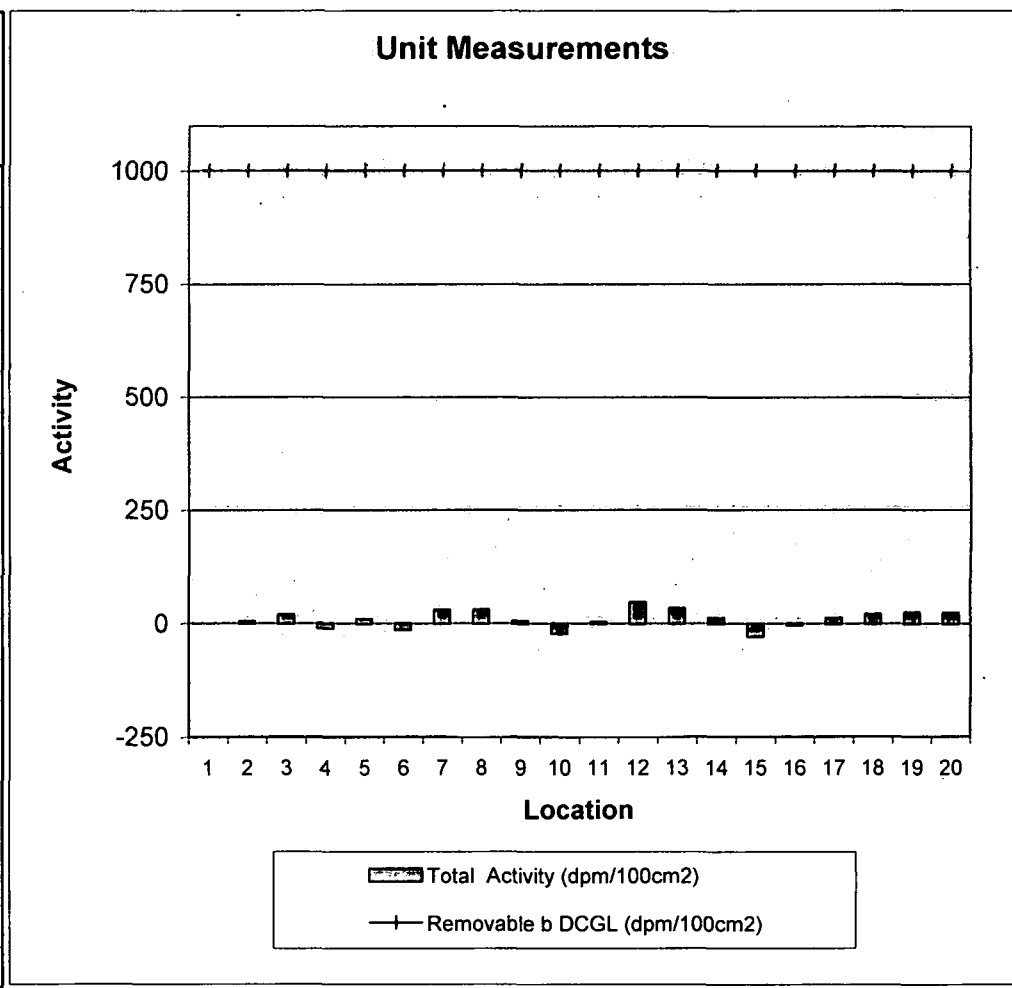
Removable Activity - Beta-Gamma

883008

8/8/01

				Instrument:	1 155596	2 155596	3 155596
standard deviation:	19.3	max:	45.5	Instrument background:	98.0	90.0	93.0 cpm
mean:	9.8	min:	-29.0	Instrument efficiency:	39.6%	39.6%	39.6%
median:	11.4			Instrument MDA:	67.5	64.8	66.0 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Removable β DCGL (dpm/100cm ²)
1	883 east facing walls.	93.0	93.0	0.0	1000
2	883 east facing walls.	95.0	93.0	5.1	1000
3	883 east facing walls.	106.0	98.0	20.2	1000
4	883 east facing walls.	89.0	93.0	-10.1	1000
5	883 east facing walls.	97.0	93.0	10.1	1000
6	883 east facing walls.	84.5	90.0	-13.9	1000
7	883 east facing walls.	105.0	93.0	30.3	1000
8	883 east facing walls.	105.0	93.0	30.3	1000
9	883 east facing walls.	92.0	90.0	5.1	1000
10	883 east facing walls.	84.0	93.0	-22.7	1000
11	883 east facing walls.	94.5	93.0	3.8	1000
12	883 east facing walls.	111.0	93.0	45.5	1000
13	883 east facing walls.	106.0	93.0	32.8	1000
14	883 east facing walls.	98.0	93.0	12.6	1000
15	883 east facing walls.	78.5	90.0	-29.0	1000
16	883 east facing walls.	89.0	90.0	-2.5	1000
17	883 east facing walls.	98.0	93.0	12.6	1000
18	883 east facing walls.	101.0	93.0	20.2	1000
19	883 east facing walls.	102.5	93.0	24.0	1000
20	883 east facing walls.	99.0	90.0	22.7	1000



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RADIOLOGICAL CLOSEOUT SURVEY FOR

Survey Area: 883008

Survey Unit: 883008

Classification: 3

Building: 883

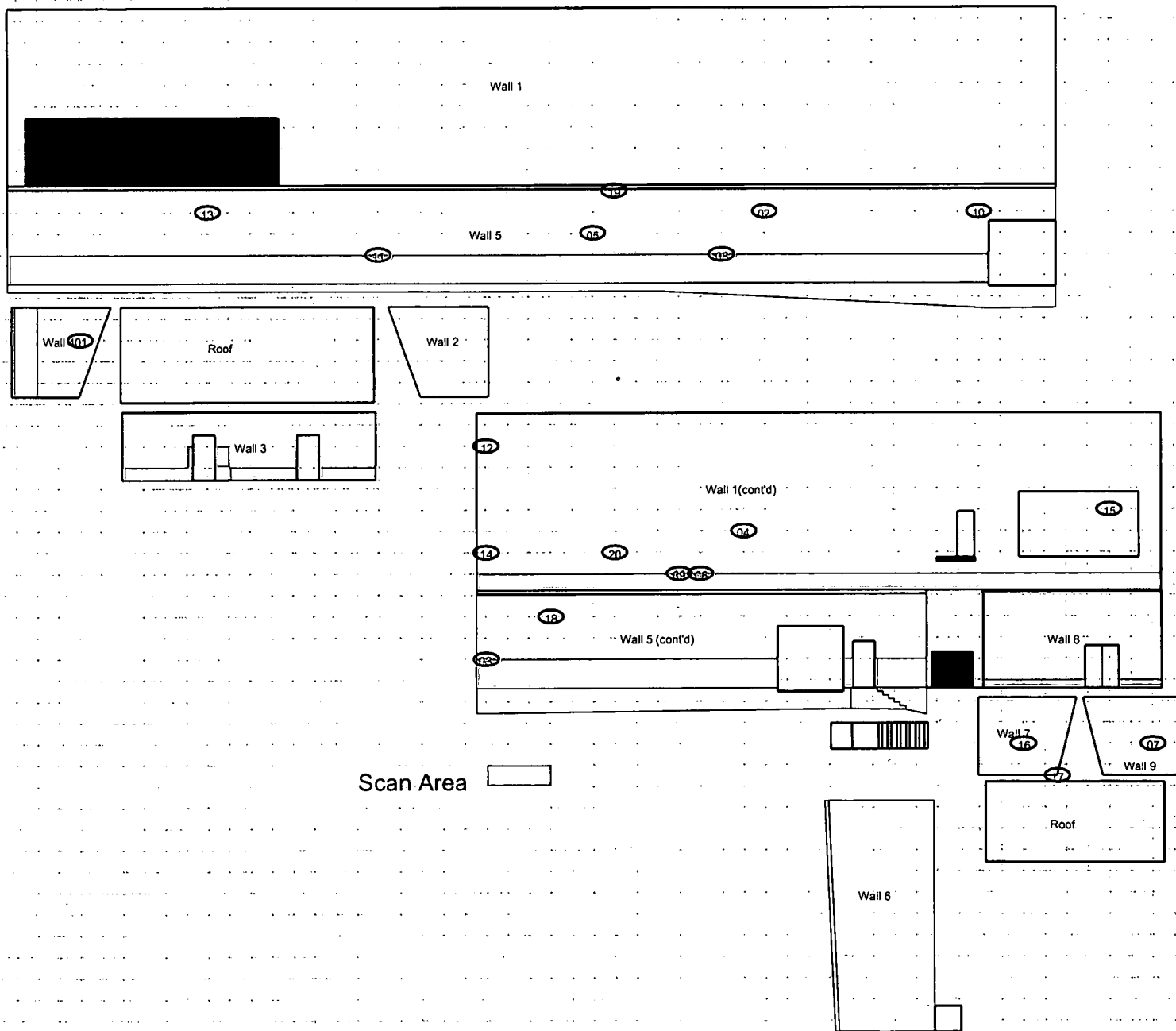
Survey Unit Description: Exterior East Walls

Total Floor Area: NA

Total Area: 1302 sq. m

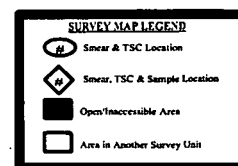
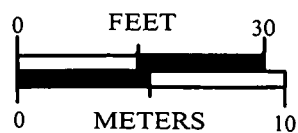
Grid Size: N/A

SURVEY UNIT 883008 - MAP 1 OF 1



Scan Area

Wall 20



136
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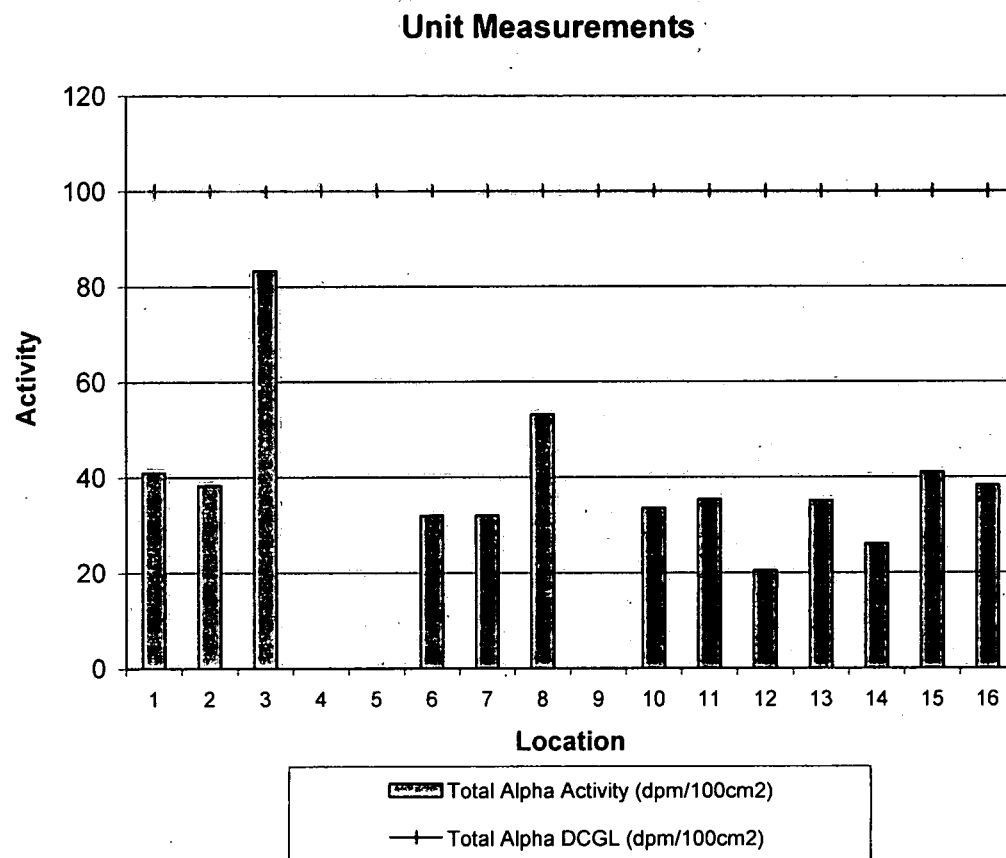
TSA Alpha

883009

9/26/01

					1	2	3	4	5
				Instrument:	3114	1665	394 QC	3114	394
standard deviation:	21.9	max:	83.3	Ave. Instrument background:	4.2	4.2	2.0 cpm	4.2	4.2 cpm
mean:	31.2	min:	-1.0	Instrument efficiency:	22.2%	21.2%	21.8%	22.0%	21.8%
median:	33.5			Instrument MDA:	48	48	48 dpm	48	48 dpm

	Surface Location	Total Alpha Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Alpha Activity (dpm/100cm ²)	Total Alpha DCGL (dpm/100cm ²)
1	883 west facing walls.	13.3	2.0	40.9	100
2	883 west facing walls.	12.7	4.0	38.2	100
3	883 west facing walls.	22.7	3.3	83.3	100
4	883 west facing walls.	4.0	4.0	-1.0	100
5	883 west facing walls.	4.0	2.7	-1.0	100
6	883 west facing walls.	11.3	6.7	31.9	100
7	883 west facing walls.	11.3	4.7	31.9	100
8	883 west facing walls.	16.0	4.0	53.1	100
9	883 west facing walls.	4.0	2.0	-1.0	100
10	883 west facing walls.	11.3	4.0	33.5	100
11	883 west facing walls.	12.0	2.0	35.4	100
12	883 west facing walls.	8.7	2.7	20.4	100
13	883 west facing walls.	12.0	19.3	35.1	100
14	883 west facing walls.	10.0	1.3	26.1	100
15	883 west facing walls.	13.3	2.0	40.9	100
16	883 west facing walls.	12.7	2.7	38.2	100
9 QC	883 west facing walls.	6.0	4.0	18.3	100
13 QC	883 west facing walls.	0.0	0.0	-9.2	100



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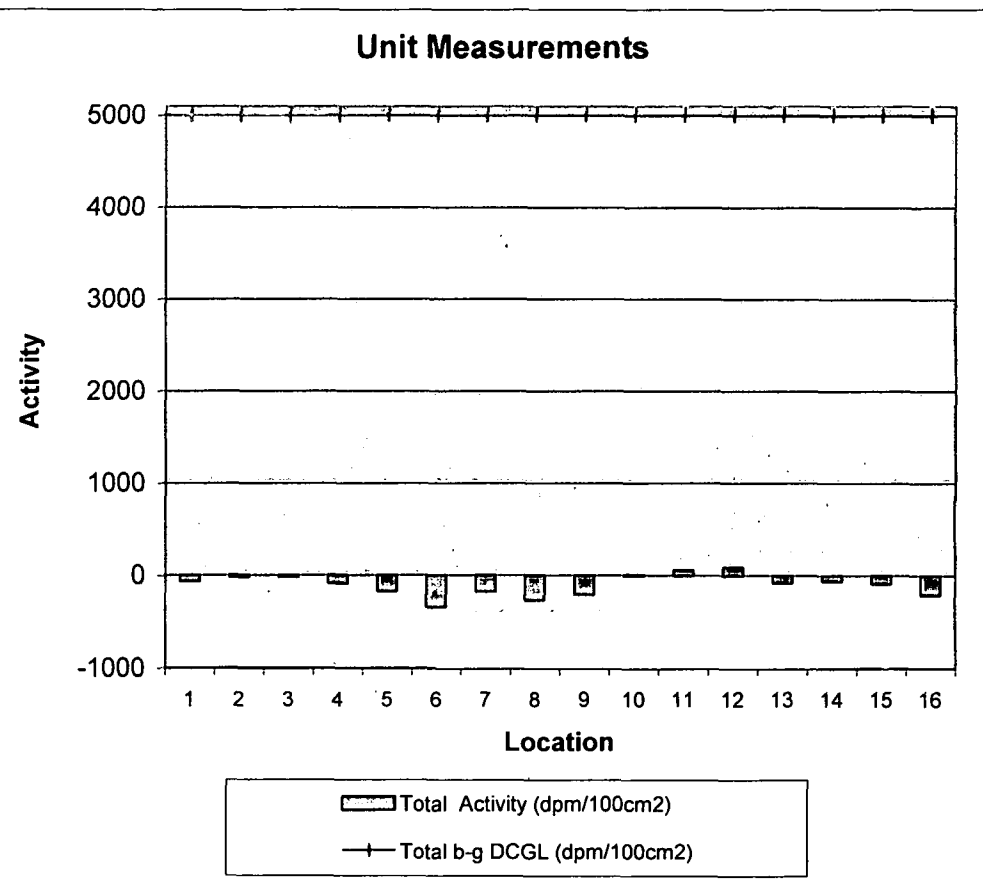
TSA Beta-Gamma

883009

9/26/01

				1	2	3	4	5	
				Instrument:	<u>3114</u>	<u>1665</u>	<u>394</u> QC	<u>3114</u>	<u>394</u>
standard deviation:	116.0	max:	90.1	Ave. Instrument background:	406.2	406.2	382.0 cpm	406.2	406.2 cpm
mean:	-90.4	min:	-334.2	Instrument efficiency:	22.2%	21.2%	21.8%	22.0%	21.8%
median:	-77.4			Instrument MDA:	48	48	48 dpm	48	48 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Local Area Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Total β-γ DCGL (dpm/100cm ²)
1	883 west facing walls.	393	380	-59.4	5000
2	883 west facing walls.	403	387	-14.4	5000
3	883 west facing walls.	403	313	-14.4	5000
4	883 west facing walls.	389	463	-81.2	5000
5	883 west facing walls.	372	379	-161.6	5000
6	883 west facing walls.	332	450	-334.2	5000
7	883 west facing walls.	369	351	-167.5	5000
8	883 west facing walls.	349	351	-257.6	5000
9	883 west facing walls.	364	423	-199.4	5000
10	883 west facing walls.	408	369	8.6	5000
11	883 west facing walls.	419	483	58.2	5000
12	883 west facing walls.	426	498	90.1	5000
13	883 west facing walls.	389	455	-77.4	5000
14	883 west facing walls.	393	432	-59.4	5000
15	883 west facing walls.	387	426	-86.4	5000
16	883 west facing walls.	360	339	-208.1	5000
9 QC	883 west facing walls.	359	419	-105.5	5000
13 QC	883 west facing walls.	337	345	-206.4	5000



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Removable Activity - Alpha

883009

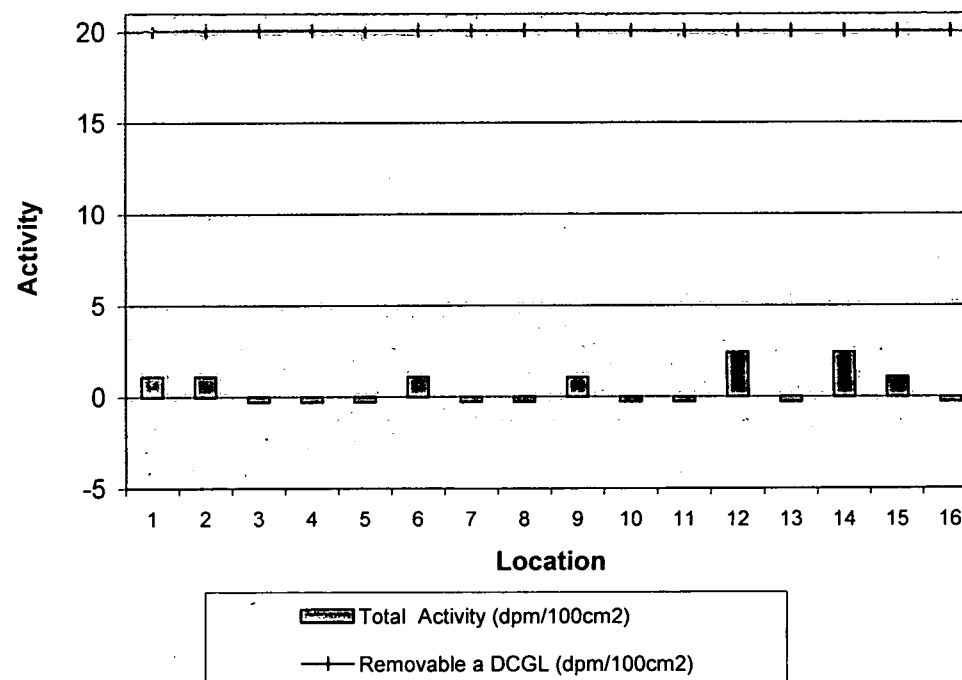
8/13/01

standard deviation: 1.0 max: 2.4
mean: 0.5 min: -0.3
median: -0.3

Instrument: 155596 155596
Instrument background: 0.1 0.3 cpm
Instrument efficiency: 37.2% 37.2%
Instrument MDA: 6 10 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Removable α DCGL (dpm/100cm ²)
1	883 west facing walls.	0.5	0.1	1.1	20
2	883 west facing walls.	0.5	0.1	1.1	20
3	883 west facing walls.	0.0	0.1	-0.3	20
4	883 west facing walls.	0.0	0.1	-0.3	20
5	883 west facing walls.	0.0	0.1	-0.3	20
6	883 west facing walls.	0.5	0.1	1.1	20
7	883 west facing walls.	0.0	0.1	-0.3	20
8	883 west facing walls.	0.0	0.1	-0.3	20
9	883 west facing walls.	0.5	0.1	1.1	20
10	883 west facing walls.	0.0	0.1	-0.3	20
11	883 west facing walls.	0.0	0.1	-0.3	20
12	883 west facing walls.	1.0	0.1	2.4	20
13	883 west facing walls.	0.0	0.1	-0.3	20
14	883 west facing walls.	1.0	0.1	2.4	20
15	883 west facing walls.	0.5	0.1	1.1	20
16	883 west facing walls.	0.0	0.1	-0.3	20

Unit Measurements



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Removable Activity - Beta-Gamma

883009

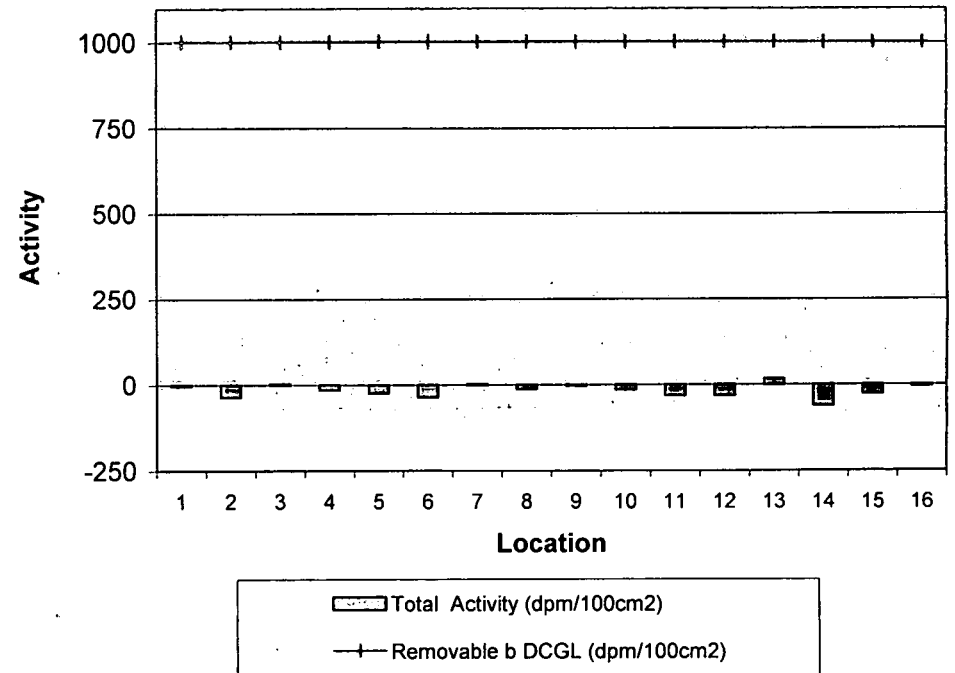
8/13/01

standard deviation: 19.5 max: 16.4
mean: -17.1 min: -59.3
median: -13.9

Instrument: 155596 155596
Instrument background: 100.0 97.0 cpm
Instrument efficiency: 39.6% 39.6%
Instrument MDA: 68 67 dpm

	Surface Location	Total Counts (cpm/100cm ²)	Bkgd (cpm/100cm ²)	Total Activity (dpm/100cm ²)	Removable β DCGL (dpm/100cm ²)
1	883 west facing walls.	99.0	100.0	-2.5	1000
2	883 west facing walls.	86.5	100.0	-34.1	1000
3	883 west facing walls.	101.5	100.0	3.8	1000
4	883 west facing walls.	94.5	100.0	-13.9	1000
5	883 west facing walls.	91.0	100.0	-22.7	1000
6	883 west facing walls.	86.0	100.0	-35.4	1000
7	883 west facing walls.	101.0	100.0	2.5	1000
8	883 west facing walls.	95.5	100.0	-11.4	1000
9	883 west facing walls.	99.5	100.0	-1.3	1000
10	883 west facing walls.	95.0	100.0	-12.6	1000
11	883 west facing walls.	88.0	100.0	-30.3	1000
12	883 west facing walls.	88.0	100.0	-30.3	1000
13	883 west facing walls.	106.5	100.0	16.4	1000
14	883 west facing walls.	76.5	100.0	-59.3	1000
15	883 west facing walls.	90.0	100.0	-25.3	1000
16	883 west facing walls.	98.5	100.0	-3.8	1000

Unit Measurements



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RADIOLOGICAL CLOSEOUT SURVEY FOR

Survey Area: 883009

Survey Unit: 883009

Classification: 3

Building: 883

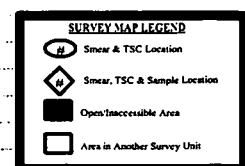
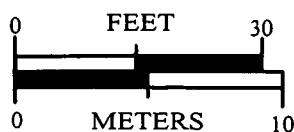
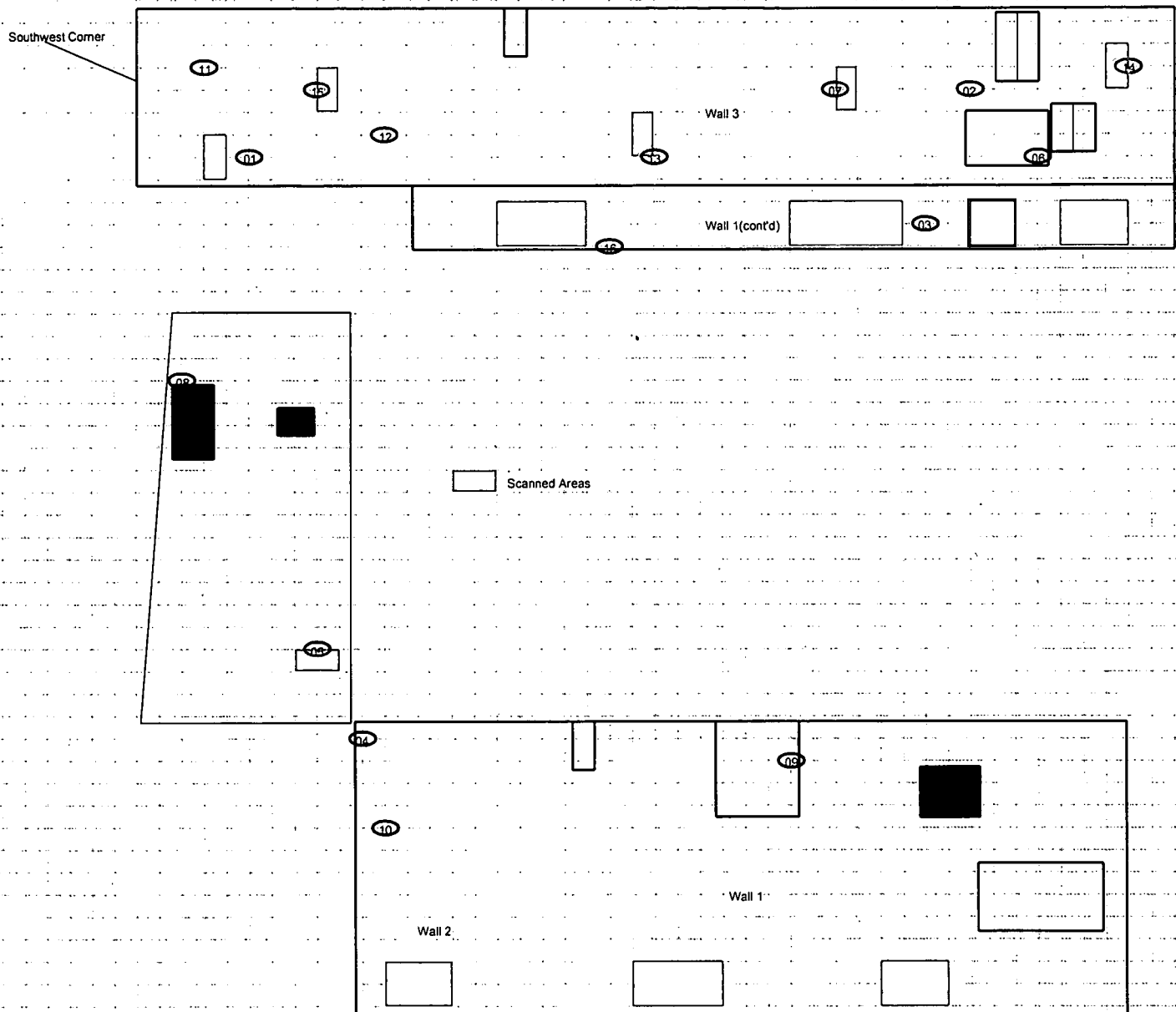
Survey Unit Description: Exterior West Walls

Total Floor Area: NA

Total Area: 1045 sq. m

Grid Size: N/A

SURVEY UNIT 883009 - MAP 1 OF 1



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ATTACHMENT E-5

B883 Gamma Spectroscopy Analysis

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GAMMA SPECTROSCOPY

ANALYTICAL RESULTS

743
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Analysis Results Header

9/25/2001 3:21:18 PM

Page 1

***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **

Report Generated On : 9/25/2001 3:21:18 PM

RIN Number : 01D1514
Analytical Batch ID : 0109254467
Line Item Code : RC10B019

Filename: A:\G1900006.CNF

Sample Number : 01D1514-001.001
Lab Sample Number : CMLS-598
Sample Receipt Date : 9/25/2001
Sample Volume Received : 1.00E+000 grams

Result Identifier : N/A

Peak Locate Threshold : 3.00
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.500 keV

Sample (Final Aliquot Size) : 7.050E+000 grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 9/12/2001 12:45:00 PM
Acquisition Started : 9/25/2001 12:34:46 PM

Count Time : 3600.0 seconds
Real Time : 3600.3 seconds
Dead Time : 0.01 %

Energy Calibration Used Done On : 7/24/01
Energy = -0.283 + 0.250*ch + -7.58E-008*ch^2 + 9.83E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 9/25/01
Efficiency Geometry ID : 01D1514

Analyzed By: Sheri Chambers Date: 9/25/01Reviewed By: Larry Umbaugh Date: 9/26/01

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***** Sample and QC Sample Results Summary *****

Site Sample ID : 01D1514-001.001

Analytical Batch ID : 0109254467

Sample Type (Result Identifier): G19

Lab Sample Number : CMLS-598

Geometry ID : 01D1514

Filename: A:\G1900006.CNF

Detector Name: LEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual
Appendix B; Basic Algorithms.

Analyte	Activity (pCi/grams)	2-Sigma Uncertainty (pCi/grams)	MDA (pCi/grams)
K-40	0.00E+000	0.00E+000	2.34E+001
TL-208	0.00E+000	0.00E+000	1.79E+000
PO-210	0.00E+000	0.00E+000	1.75E+005
BI-212	0.00E+000	0.00E+000	2.47E+001
PB-212	0.00E+000	0.00E+000	1.42E+000
BI-214	0.00E+000	0.00E+000	3.62E+000
PB-214	0.00E+000	0.00E+000	2.48E+000
RA-226	0.00E+000	0.00E+000	1.55E+001
AC-228	0.00E+000	0.00E+000	6.88E+000
TH-230	0.00E+000	0.00E+000	1.09E+002
Th-231	0.00E+000	0.00E+000	8.05E+000
PA-234	0.00E+000	0.00E+000	1.87E+000
PA-234M	0.00E+000	0.00E+000	2.80E+002
* TH-234	2.34E+002	1.16E+002	9.82E+000
U-235	2.52E+000	1.81E+000	9.61E-001
AM-241	0.00E+000	0.00E+000	1.37E+000

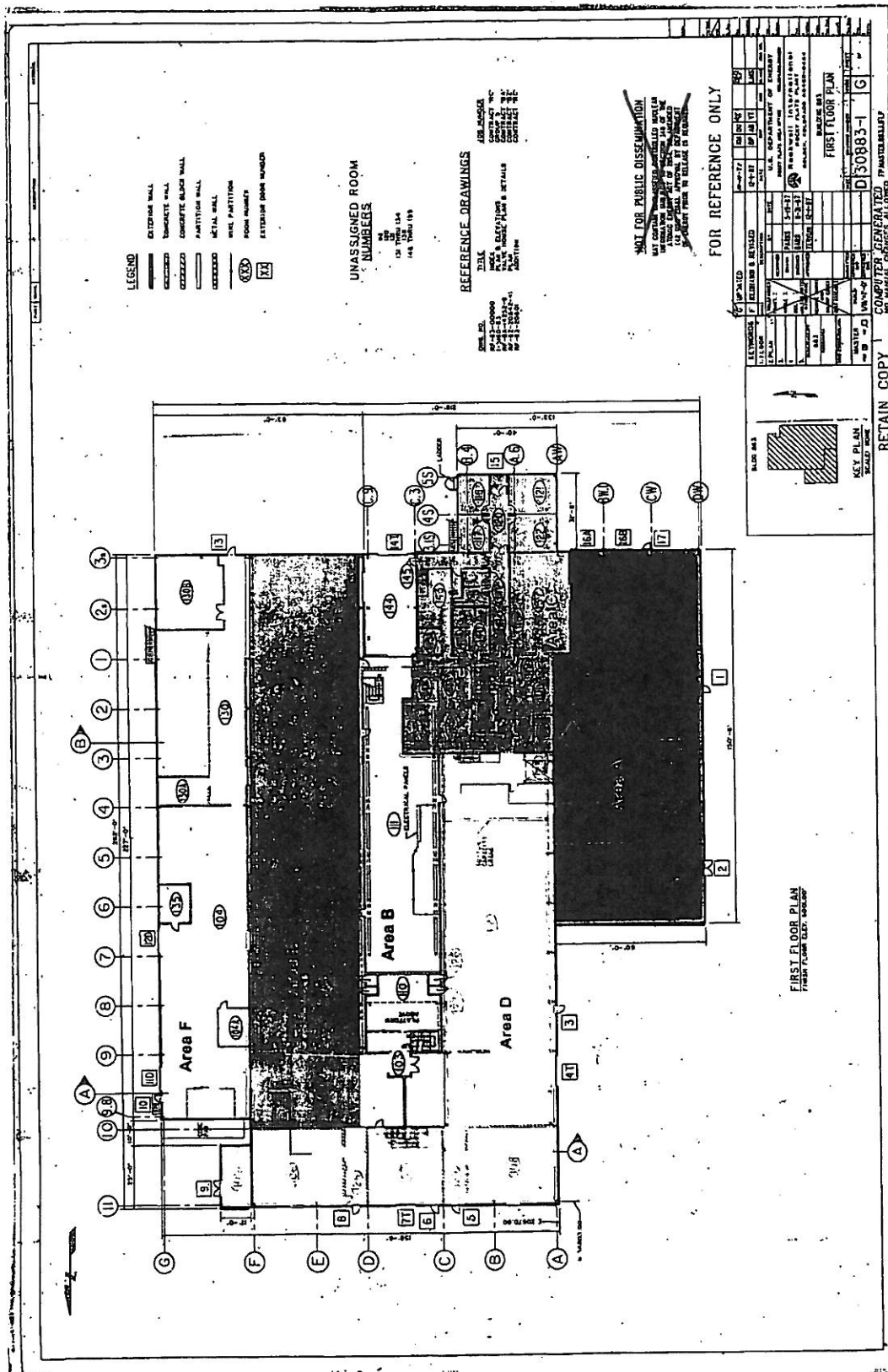
*Th-234 is the recommended activity for U-238. JB 10/1/01

ATTACHMENT F

Chemical Data Summaries and Sample Maps

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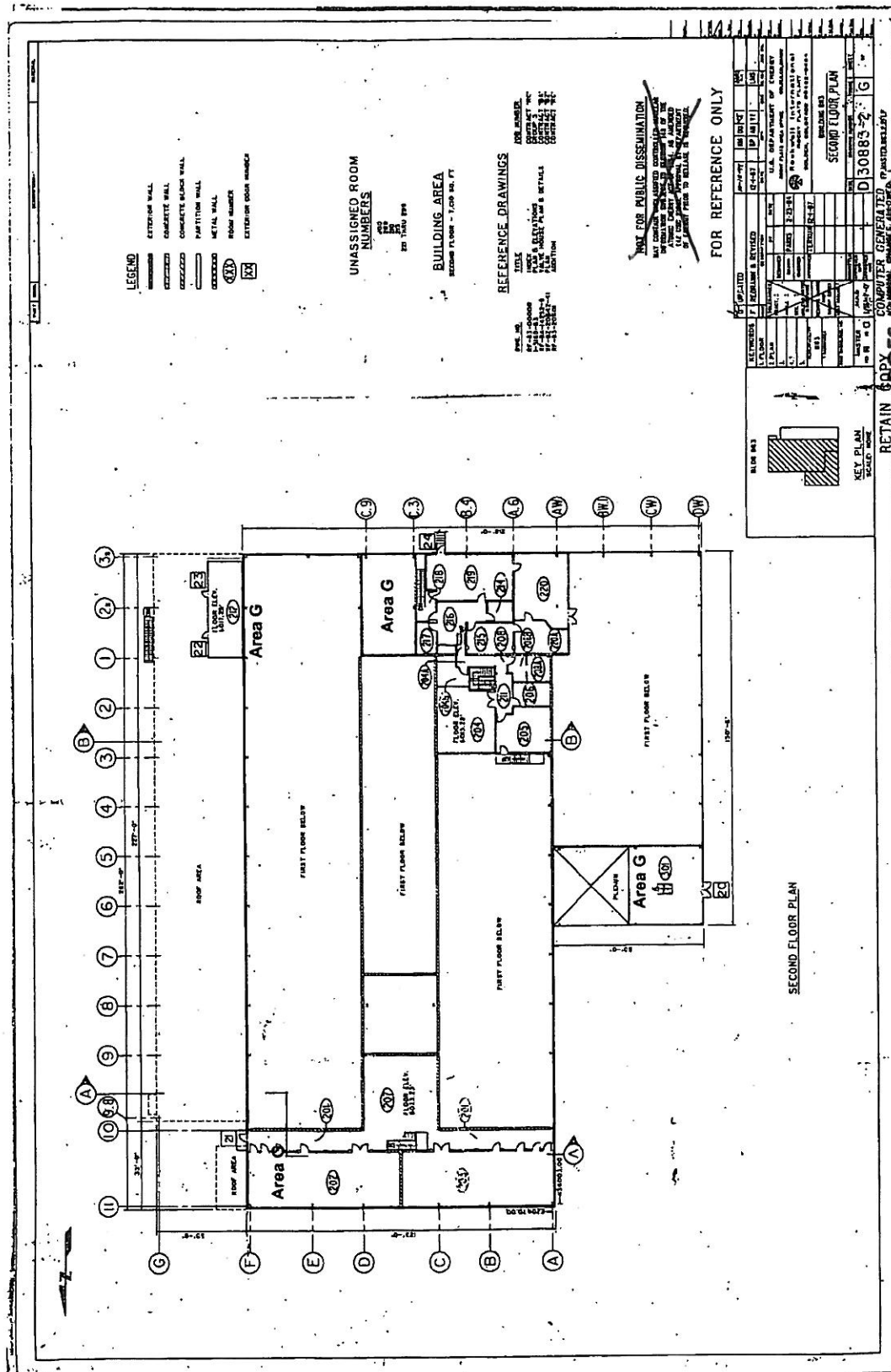
~~146~~ ~~146~~



DOES NOT CONTAIN
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION

Reviewing Official: J. A. NESHEIM
EMBC Class Name: J. A. NESHEIM
Date: 10-13-08

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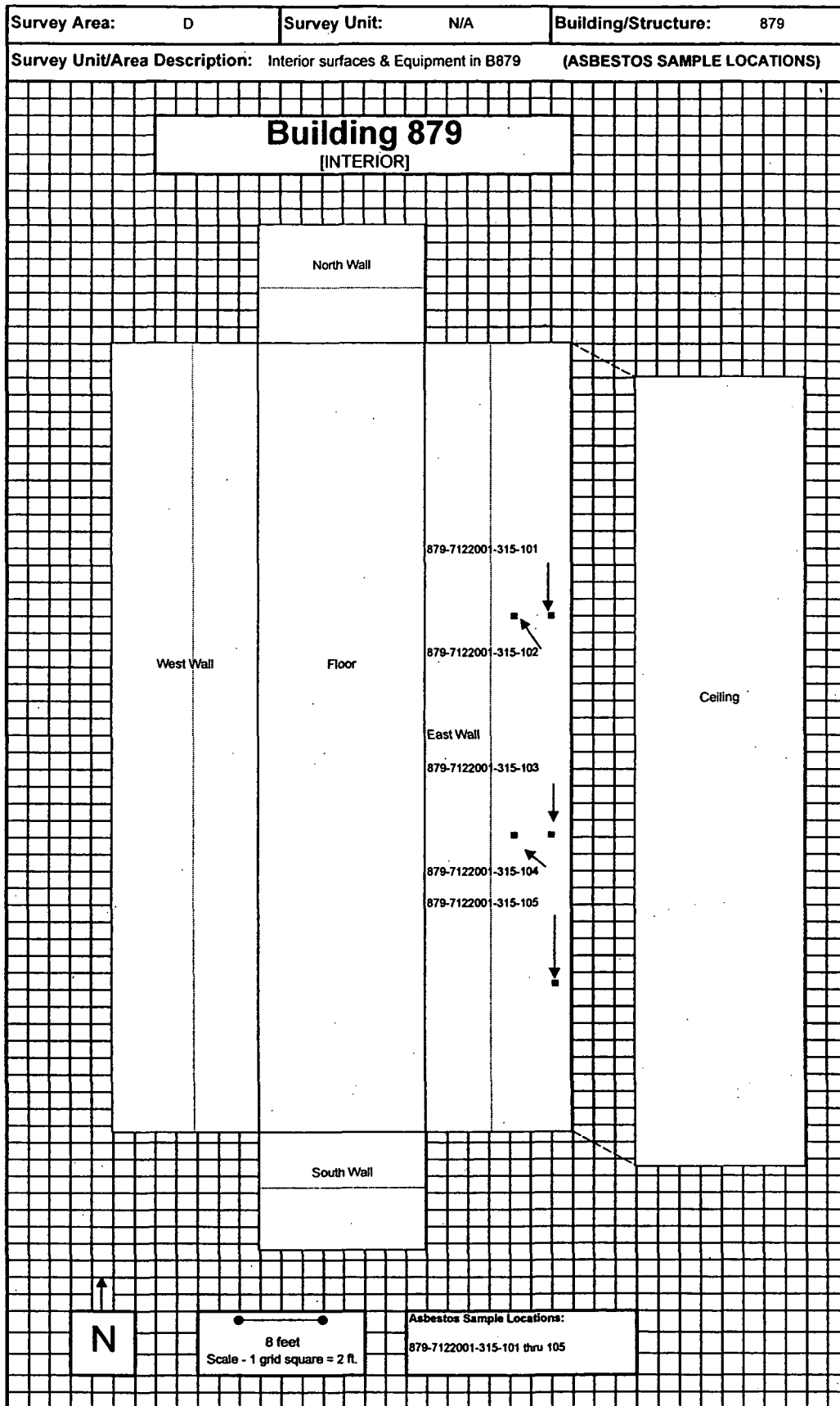
Reviewing Official: J. A. NESHEIM
 EMOB C. Class Name OFFICE
 Date: 10-13-08

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Table F-1 Asbestos Data Summary, Building 879

Sample Number	Material Sampled & Location	Analytical Results
879-07122001-315-101	Gray, spray-on acoustical fireproofing on east wall	None Detected
879-07122001-315-102	Gray, spray-on acoustical fireproofing on east wall	None Detected
879-07122001-315-103	Gray, spray-on acoustical fireproofing on east wall	None Detected
879-07122001-315-104	Gray, spray-on acoustical fireproofing on east wall	None Detected
879-07122001-315-105	Gray, spray-on acoustical fireproofing on east wall	None Detected

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Table F-2 B883 Beryllium Data Summary, MSC Data

SURVEY AREA	A	B	C	D	E
-------------	---	---	---	---	---

Floors and Lower Walls (<2 meters)

Be Smears

Number of Be Samples:	53	58	95	0	0
Minimum Be Sample Value ($\mu\text{g}/100\text{ cm}^2$):	ND	ND	ND	0	0
Maximum Be Sample Value ($\mu\text{g}/100\text{ cm}^2$):	0.08	0.67	9.23	0	0
Number of Be Sample Samples $>0.2\text{ }\mu\text{g}/100\text{ cm}^2$:	0	3	49	0	0
Number of Be Sample Samples $>3.0\text{ }\mu\text{g}/100\text{ cm}^2$:	0	0	31	0	0
Number of Be Sample Samples $>20.0\text{ }\mu\text{g}/100\text{ cm}^2$:	0	0	0	0	0

Upper Walls (>2 meters) and Ceilings

Be Smears

Number of Be Samples:	42	97	147	60	70
Minimum Be Sample Value ($\mu\text{g}/100\text{ cm}^2$):	ND	ND	ND	ND	ND
Maximum Be Sample Value ($\mu\text{g}/100\text{ cm}^2$):	0.05	25.17	0.48	1.2	0.064
Number of Be Sample Samples $>0.2\text{ }\mu\text{g}/100\text{ cm}^2$:	0	15	24	2	0
Number of Be Sample Samples $>3.0\text{ }\mu\text{g}/100\text{ cm}^2$:	0	3	0	0	0
Number of Be Sample Samples $>20.0\text{ }\mu\text{g}/100\text{ cm}^2$:	0	1	0	0	0

Equipment

Be Smears

Number of Be Samples:	0	3	12	4	0
Minimum Be Sample Value ($\mu\text{g}/100\text{ cm}^2$):	0	0.64	0	0.021	0
Maximum Be Sample Value ($\mu\text{g}/100\text{ cm}^2$):	0	3.9	0.44	22.0	0
Number of Be Sample Samples $>0.2\text{ }\mu\text{g}/100\text{ cm}^2$:	0	3	9	1	0
Number of Be Sample Samples $>3.0\text{ }\mu\text{g}/100\text{ cm}^2$:	0	1	0	1	0
Number of Be Sample Samples $>20.0\text{ }\mu\text{g}/100\text{ cm}^2$:	0	0	0	1	0

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Table F-3 B883 Beryllium Data Summary, ORNL Data

Location	Number of Be Samples	Minimum Be Sample Value ($\mu\text{g}/100 \text{ cm}^2$)	Maximum Be Sample Value ($\mu\text{g}/100 \text{ cm}^2$)
Room 136 Floor	25	0.00029	0.00230
Room 136 Lower Walls	14	0.00008	0.00099
Room 145 Floor	190	0.00008	0.02400
Room 145 Lower Walls	44	0.00008	0.01090
Room 146 Lower Walls	2	0.00020	0.00022
Room 147 Floor	2	0.00021	0.00025
Room 147 Lower Walls	1	0.00008	0.00008
Room 148 Floor	4	0.00054	0.00079
Room 148 Lower Walls	5	0.00020	0.00042
Room 153 Floor	3	0.00008	0.00140
Room 153 Lower Walls	4	0.00008	0.00008
Room HIP Floor	4	0.00021	0.00056
Room HIP Lower Walls	3	0.00008	0.00008

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Table F-4 Beryllium Data Summary in 883 Cluster

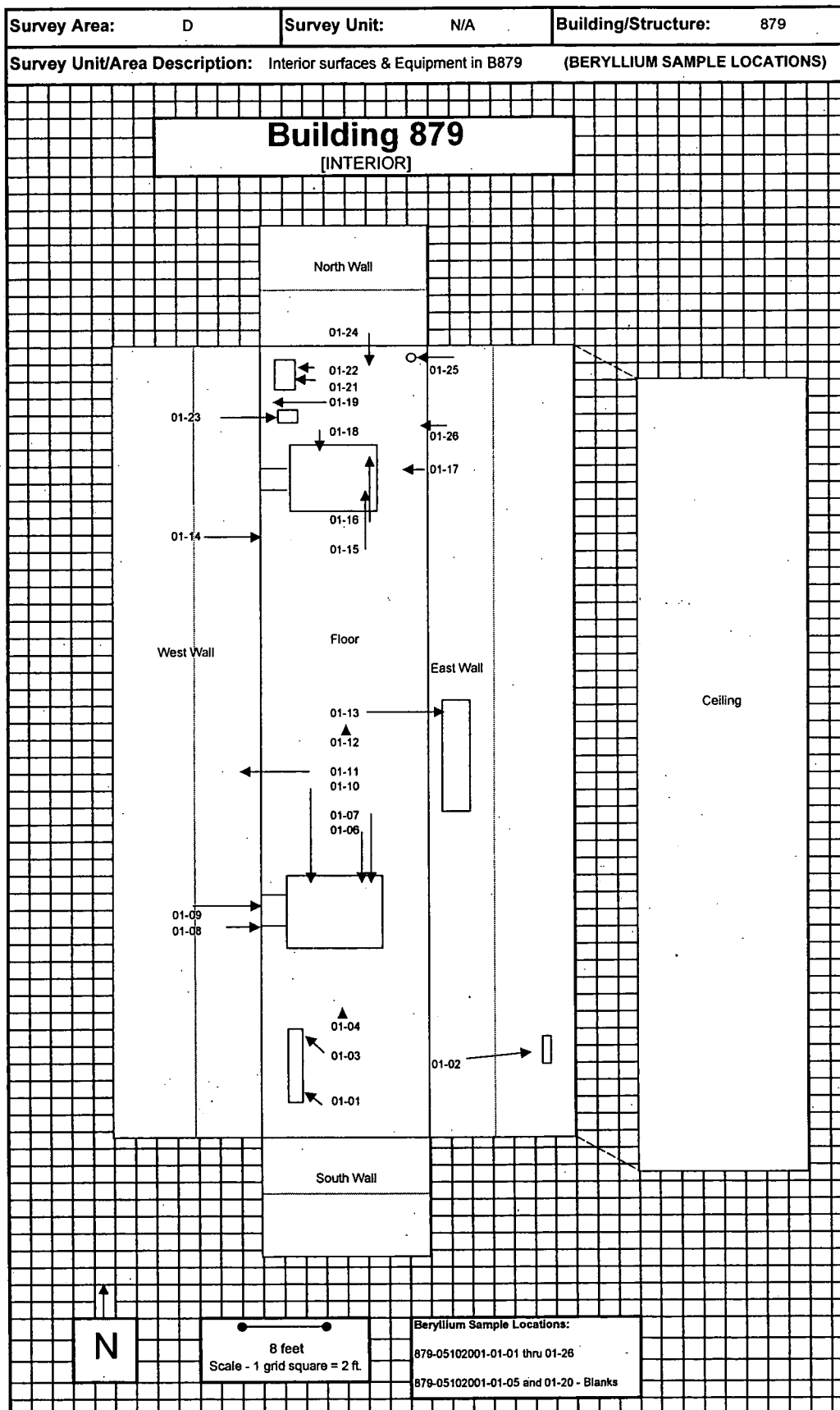
Sample Number	Sample Location	Result ($\mu\text{g}/100\text{ cm}^2$)
879-05102001-01-101	On top of "Panalarm" panel (6') – north end	<0.1
879-05102001-01-102	On egress light – north end of room	<0.1
879-05102001-01-103	On top of volume air control panel – north end	<0.1
879-05102001-01-104	On floor near north end of room	<0.1
879-05102001-01-105	Blank	<0.1
879-05102001-01-106	On motor for a fan – north end of room	<0.1
879-05102001-01-107	On fan gear guard for a fan, 6' – north end	<0.1
879-05102001-01-108	On vibration boot going into Plenum for a fan	<0.1
879-05102001-01-109	Floor behind a fan	<0.1
879-05102001-01-110	On access hatch for fan north end, 8'	<0.1
879-05102001-01-111	On view port to plenum along east wall, center section	<0.1
879-05102001-01-112	On floor, central section	<0.1
879-05102001-01-113	On fire extinguisher sitting on west wall, central section	<0.1
879-05102001-01-114	On vibration boot going into plenum-B fan, south end	<0.1
879-05102001-01-115	On motor for B-fan, south end	<0.1
879-05102001-01-116	On fan gear guard, B-fan, south end	<0.1
879-05102001-01-117	Floor, west side, B-fan, south end	<0.1
879-05102001-01-118	On access panel for B-fan, south end, 8'	<0.1
879-05102001-01-119	On view port for plenum along east wall, south end	<0.1
879-05102001-01-120	Blank	<0.1
879-05102001-01-121	On top of "Panalarm" panel, south end 6'	<0.1
879-05102001-01-122	On top of volume air controller panel, south end	<0.1
879-05102001-01-123	On boxes of air filters, south end	<0.1
879-05102001-01-124	On floor, south end	<0.1
879-05102001-01-125	On black drums, south end	<0.1
879-05102001-01-126	On structural beam, west wall, south end	<0.1
883-7302001-315-101	Room 138, bottom of trench, cold water process lines, east branch	<0.1
883-7302001-315-102	Room 138, bottom of trench, cold water process lines, south end	<0.1
883-7302001-315-103	Room 139, bottom of Acid tank pit, horizontal	<0.1
883-7302001-315-104	Room 139, bottom of Acid tank pit, horizontal	<0.1
883-7302001-315-105	Room 139, trench north of pit, bottom horizontal	<0.1
883-7302001-315-106	Room 139, trench north of pit, bottom horizontal	<0.1

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Sample Number	Sample Location	Result (ug/100 cm ²)
883-7302001-315-107	Room 112, pit, east side of B-Roller Mill, bottom	<0.1
883-7302001-315-108	Room 112, pit, east side of B-Roller Mill, horizontal equipment surface	0.114
883-7302001-315-109	Room 112, pit/trench, running east/west of B-Roller Mill, top of reinforced poly	<0.1
883-7302001-315-110	Room 112, pit/trench, running east/west of B-Roller Mill, bottom	<0.1
883-7302001-315-111	Room 102, pit under HPM B Press on grating 4' from the bottom	<0.1
883-7302001-315-112	Room 102, pit under HPM B Press on grating 4' from the bottom	<0.1
883-7302001-315-113	Room 109, pit under HPM A Press, 4' down on I beam	0.115
883-7302001-315-114	Room 109, pit under HPM A Press, 4' down on I beam	0.107
883-7302001-315-115	Room 109, pit between HPM A Press & Erie Press 1, grating	4.9112
883-7302001-315-116	Room 109, pit between HPM A Press & Erie Press 1, grating	4.3495
883-8062001-315-117	Room 109, bottom of pit, south of Erie Press 1	0.219
883-8062001-315-118	Room 109, bottom of pit, south of Erie Press 1	0.311
883-8062001-315-119	Room 109, northeast corner, bottom of trench/pit	3.6186
883-8062001-315-120	Room 109, northeast corner, bottom of trench/pit	8.4183
883-8062001-315-121	Room 109, bottom of pit, Erie Press 1 extending south	0.175
883-8062001-315-122	Room 109, bottom of pit, Erie Press 1 extending south	<0.1
883-8062001-315-123	Room 104, bottom of sump remover	<0.1
883-8062001-315-124	Room 104, bottom of sump remover	<0.1
883-8062001-315-125	Room 104, trench adjacent to scale	0.554
883-8062001-315-126	Room 104, trench adjacent to scale	0.320
883-8072001-315-127	Room 104, pit, mid-room east	<0.1
883-8072001-315-128	Room 104, pit, mid-room east	<0.1
883-8072001-315-129	Room 105, pit, 300 Ton Press 1, east	1.8207
883-8072001-315-130	Room 105, pit, 300 Ton Press 1, east	0.255
883-8072001-315-131	Room 105, pit, 300 Ton Press 1, west	<0.1
883-8072001-315-132	Room 105, pit, 300 Ton Press 1, west	0.261
883-8072001-315-133	Room 105, F4/F5 pit, 4' deep	<0.1
883-8072001-315-134	Room 105, F4/F5 pit, 4' deep	<0.1
883-8072001-315-135	Room 105, B roller, south end of pit, east side	<0.1
883-8072001-315-136	Room 105, B roller, south end of pit, east side	<0.1
883-8072001-315-137	Room 105, B roller, mid-west side, ladder access	1.0005
883-8072001-315-138	Room 105, B roller, mid-west side, ladder access	1.2527
883-8072001-315-139	Room 105, electric cable channel, west of B roller	0.548

Sample Number	Sample Location	Result ($\mu\text{g}/100\text{ cm}^2$)
883-8072001-315-140	Room 105, electric cable channel, west of B roller	21.903
883-8072001-315-141	Room 1, Basement, Rat pit	<0.1
883-8072001-315-142	Room 1, Basement, Rat pit	<0.1
883-8082001-315-143	Room 123, bottom of elevator shaft	<0.1
883-8082001-315-144	Room 123, bottom of elevator shaft	<0.1
883-8082001-315-145	Room 139, pit, Nitric Acid tank 1	<0.1
883-8082001-315-146	Room 139, pit, Nitric Acid tank 1	<0.1
883-8082001-315-147	Room 139, pit, Nitric Acid tank 2	<0.1
883-8082001-315-148	Room 139, pit, Nitric Acid tank 2	<0.1
883-8272001-315-149	Room 138A, west bay, manhole	<0.1
883-8272001-315-150	Room 138A, west bay, manhole	<0.1
883-9052001-315-151	Room 109, Confined space, A side Press	2.29
883-9052001-315-152	Room 109, Confined space, A side Press	1.50
883-9052001-315-153	Room 102, Confined space, B side Press	3.0959
883-9052001-315-154	Room 102, Confined space, B side Press	0.192
883-9062001-315-155	Room 138, Scale	<0.1
883-9062001-315-156	Room 138, Scale	<0.1
883-9072001-315-157	Room 102, floor beneath glove box location	<0.1
883-9072001-315-158	Room 102, floor beneath glove box location	<0.1

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**RCRA/CERCLA Constituents Data Summary
B883**

Sample Location / Media	Sample Number: Analysis	Result (ug/L)
Clearing Press (rm 105) / Oil	01S0109-001.002 : VOA, SVOA	VOAs and SVOAs less than regulatory limits
"A" Press (rm 109) / Oil	01S0109-002.002: VOA, SVOA	VOAs and SVOAs less than regulatory limits
"B" Press (rm 102) / Oil	01S0109-003.002: VOA, SVOA	VOAs and SVOAs less than regulatory limits
"B" Mill (rm 112) / Water	01S0109-004.007 & 004: VOA, SVOA respectively	VOAs and SVOAs less than regulatory limits

**RCRA/CERCLA Constituents Data Summary
B883 Tank 013 and Tank 016**

Sample Location / Media	Sample Number: Analysis	Result (ug/L)
Tank 013 / Water	01S0102-001.008 & 005 : VOA, SVOA respectively	VOAs and SVOAs less than regulatory limits
Tank 013 / Sediment	01S0105-001.005 & 004: VOA, SVOA respectively	VOAs and SVOAs less than regulatory limits
Tank 016 / Water	01S0102-002.008 & 005: VOA, SVOA respectively	VOAs and SVOAs less than regulatory limits
Tank 016 / Sediment	01S0105-002.005 & 004: VOA, SVOA respectively	VOAs and SVOAs less than regulatory limits

**Total Metals Data Summary
B883**

Sample Location / Media	Sample Number	Result (ug/L)
Clearing Press (rm 105) / Oil	01S0109-001.002	Total Metals less than regulatory limits
"A" Press (rm 109) / Oil	01S0109-002.002	Total Metals less than regulatory limits
"B" Press (rm 102) / Oil	01S0109-003.002	Total Metals less than regulatory limits
"B" Mill (rm 112) / Water	01S0109-004.010	Total Metals less than regulatory limits
Elevator Shaft Floor / Oil	01S0101-001.003	Total Metals less than regulatory limits

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**Total Metals Data Summary
B883 Tank 013 and Tank 016**

Sample Location / Media	Sample Number	Result (ug/L)
Tank 013 / Water	01S0102-001.002	Total Metals less than regulatory limits
Tank 013 / Sediment	01S0105-001.002	Total Metals less than regulatory limits
Tank 016 / Water	01S0102-002.002	Total Metals less than regulatory limits
Tank 016 / Sediment	01S0105-002.002	Total Metals less than regulatory limits

RCRA Metals

Analyte	Regulatory limit (mg/L)
Arsenic (D004)	5.0
Barium (D005)	100.0
Cadmium (D006)	1.0
Chromium (D007)	5.0
Lead (D008)	5.0
Mercury (D009)	0.2
Selenium (D010)	1.0
Silver (D011)	5.0

Volatile Organics Analyzed

Analyte	Regulatory limit (mg/L)
Vinyl Chloride (D043)	0.2
1,1-Dichloroethene (D029)	0.7
Chloroform (D022)	6.0
1,2- Dichloroethane (D028)	0.5
2-Butanone (D035)	200.0
Carbon Tetrachloride (D019)	0.5
Trichloroethene (D040)	0.5
Benzene (D018)	0.5
Tetrachlorobenzene (D039)	0.7
Chlorobenzene (D021)	100.0
1,4- Dichlorobenzene (D027)	7.5

**PCB Data Summary
B883**

Sample Location / Media	Sample Number	Result (mg/L)
Clearing Press (rm 105) / Oil	01S0109-001.002	PCBs detected at 1,200 and 2,00 ppm
"A" Press (rm 109) / Oil	01S0109-002.002	PCBs less than regulatory limits
"B" Press (rm 102) / Oil	01S0109-003.002	PCBs less than regulatory limits
"B" Mill (rm 112) / Water	01S0109-004.002	PCBs less than regulatory limits
Elevator Shaft Floor / Oil	01S0101-001.002	PCBs less than regulatory limits

**PCB Data Summary
Tank 013 and Tank 016**

Sample Location / Media	Sample Number	Result (mg/L)
Tank 013 / Water	01S0102-001.002	PCBs less than regulatory limits
Tank 013 / Sediment	01S0105-001.003	PCBs less than regulatory limits
Tank 016 / Water	01S0102-002.002	PCBs less than regulatory limits
Tank 016 / Sediment	01S0105-002.003	PCBs less than regulatory limits

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ATTACHMENT G

Decommissioning Waste Types And Volume Estimates

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Attachment G – Decommissioning Waste Types and Volumes Estimates

Facility	Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated/ Sheet Metal (cu ft)	Wall Board (cu ft)	ACM (cu ft)	Other Waste (cu ft)
883	102,269	0	11,650	0	3,345	Friable – 7,452 Non-Friable – 19,845	Urethane 19,224 cu ft
879	3,000	0	2,300	950	0	0	Roofing buildup 400 cu ft Insulation 1,300 cu ft

- (1) Volume will be re-estimated after the facility is inspected and related analytical data are assessed.
- (2) Friable building materials include, but are not limited to, thermal systems insulation, surfacing materials (such as spray-on fireproofing), drop ceiling tiles, and sheet vinyl linoleum. Non-friable building materials include, but are not limited to, floor tile, mastic adhesives, corrugated transite wall board, and tar-impregnated roofing.

Note: All waste types are assumed to be LLW and Be waste, unless decontaminated during in-process activities.

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ATTACHMENT H

Data Quality Assessment (DQA) Detail

DATA QUALITY ASSESSMENT (DQA)

VERIFICATION & VALIDATION OF RESULTS

V&V of the data confirm that appropriate quality controls are implemented throughout the sampling and analysis process, and that any substandard controls result in qualification or rejection of the data in question. The required quality controls and their implementation are summarized in a tabular, checklist format for each category of data – radiological surveys and chemical analyses.

DQA criteria and results are provided in a tabular format for each suite of surveys or chemical analyses performed; the radiological survey assessment is provided in Table H-1, asbestos in H-2, beryllium in H-3, and the remaining chemical analyses in Tables H-4 through H-7. A completeness summary for all results is given in Table H-8.

All relevant Quality records supporting this report are maintained in a Project File. This report and the supporting quality records will be submitted to the CERCLA Administrative Record for permanent storage within 30 days of the report's approval. All radiological data are organized into Survey Packages, which correlate to unique Survey Areas/Units. Chemical data are organized by RIN (Report Identification Number), which are traceable to sample numbers and locations.

Consistent with EPA's G-4 DQO process, the radiological survey designs – for those survey units performed per PDS requirements -- were optimized by checking actual measurement results (acquired during pre-demolition surveys) against model output with original estimates. Use of actual sample/survey (result) variances in the MARSSIM DQO model confirms that an adequate number of surveys were acquired.

SUMMARY

In summary, the data presented in this report have been verified and validated relative to quality requirements and the project decisions as stated in the original DQOs. All data are usable with the qualifications stated herein.

Table H-1 V&V of Radiological Surveys

V&V CRITERIA, RADIOLGICAL SURVEYS			K-H RSP 16.00 Series MARSSIM (NUREG-1575)		
QUALITY REQUIREMENTS					
	Parameters		Measure	frequency	COMMENTS
ACCURACY	initial calibrations		90%<x<110%	≥1	multi-point calibration through the measurement range encountered in the field; programmatic records
	daily source checks		80%<x<120%	≥1/day	
	local area background	Field	typically << 10 dpm	≥1/day	all local area backgrounds were within expected ranges (i.e., no elevated anaomalies)
PRECISION	field duplicate measurements for TSA		≥5% of real survey points	≥10% of reals	
REPRESENTATIVENESS	MARSSIM gridding methodology (Survey Units 883001 – 883009)		statistical and biased	NA	random w/ statistical confidence
	Survey Maps			NA	random and biased measurement locations controlled/mapped to ±1m
	Controlling Documents (Characterization Pkg; RSPs)		qualitative	NA	see original Characterization Package (planning document) for field/sampling procedures; thorough documentation of the planning, sampling/analysis process, and data reduction into formats
COMPARABILITY	units of measure		dpm/100cm ²	NA	Use of standardized engineering units in the reporting of measurement results
COMPLETENESS	Plan vs. Actual surveys		>95%	NA	see Table H-8 for details
	usable results vs. unusable		>95%		Derivation of final values (traceability) for initially elevated readings >DCGLw is ambiguous for Survey Unit 883007; verbal communication w/ Rad Engineer indicates final values are correct
SENSITIVITY	detection limits		TSA: ≤50 dpm/100cm ² RA: ≤10 dpm/100cm ²	all measures	MDAs ≤ ½ DCGLw per MARSSIM guidelines

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Table H-2 V&V of Chemical Results-Asbestos

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		
ASBESTOS	METHOD: EPA 600/R-93/116	LAB ---->	Reservoirs Environmental, Inc	
QUALITY REQUIREMENT		RIN ---->	01D1073	
		Measure	Frequency	COMMENTS
ACCURACY		below detectable amounts	≥1	Semi-quantitative, per (microscopic) visual estimation
PRECISION		all below detectable amounts	≥ samples	repeatability established within the sample set
REPRESENTATIVENESS	COC	Qualitative	NA	Chain-of-Custody intact: completed paperwork, containers w/ custody seals
	Hold times/preservation	Qualitative	NA	Not applicable
	Sample Maps	Quantitative	per area	
	Controlling Documents (Plans, Procedures, etc.)	Qualitative	NA	See Table H-1 for analytical methods; original Characterization Package (planning document) for field/sampling procedures; thorough documentation of the planning, sampling/analysis process, and data reduction into formats
COMPARABILITY		% by bulk volume	NA	Use of standardized engineering units in the reporting of measurement results
COMPLETENESS	Plan vs. Actual samples Usable results vs. unusable	Qualitative	NA	See Table H-8; final number of samples at Certified Inspector's discretion
SENSITIVITY	Detection limits	<1% by volume	all measures	

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Table H-3 V&V of Chemical Results-Beryllium

V&V CRITERIA, CHEMICAL ANALYSES			DATA PACKAGE		
BERYLLIUM	METHOD: OSHA ID-125G		LAB ---->	Johns Manville, Denver	
QUALITY REQUIREMENTS			RIN ---->	01D0816, 01D1449	
			measure	frequency	COMMENTS
ACCURACY	calibrations	initial		≥1	
		continuing		≥1	as above
	LCS/MS		80%<%R<120%	≥1	Accuracy of beryllium results was adequate based on acceptable percent recoveries of spikes performed on a laboratory batching basis (spikes range from 0.5 to 2 ug).
	blanks	lab & field	<MDL	≥1	all blanks within tolerance; false positive results highly improbable
	interference check std (ICP)			NA	not necessary, in absence of analysis for other metals
PRECISION	LCSD		80%<%R<120% (RPD<20%)	≥1	Intra-laboratory precision was adequate based on acceptable percent recoveries of LCSD performed on a laboratory batching basis.
	field duplicate		all results < RL	≥1	Repeatability of beryllium results was not evaluated through field duplicates, based on the removable nature of the sampling process; this is consistent with radiological survey methodology, where repeatability is only evaluated relative to TSA measurements (fixed activity), and not removable activity.
REPRESENTATIVENESS	COC		qualitative	NA	Chain-of-Custody intact:: completed paperwork, containers w/ custody seals
	hold times/preservation		qualitative	NA	not applicable
	maps				
	Controlling Documents (Plans, Procedures, etc.)		qualitative	NA	standardized analytical method; original Characterization Package (planning document) refers to field/sampling procedures; thorough documentation of the planning, sampling/analysis process; data reduction into clear and usable formats
COMPARABILITY	measurement units		ug/100cm²	NA	Use of standardized engineering units in the reporting of measurement results;
COMPLETENESS	Plan vs. Actual samples usable results vs. unusable		>95% >95%	NA	See Table H-8.
SENSITIVITY	detection limits		MDL of 0.012 ug/100cm²	all measures	Method detection limits (MDL) is well less than the investigative limit of 0.1 ug/100cm², and the contamination level of 0.2 ug/100cm².

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Table H-4 V&V of Chemical Results-Metals

V&V CRITERIA, CHEMICAL ANALYSES			DATA PACKAGE		
Metals (total)	METHOD: SW6010/6020		LAB ---->	Severn-Trent, Denver	
			RIN ---->	various	
QUALITY REQUIREMENT					COMMENTS
			measure	frequency	
ACCURACY	calibrations	initial	$r^2 > 0.99$	≥1/batch	
		continuing	80%<%R<120%	≥1/batch	
	LCS		80%<%R<120%	≥1/batch	RIN 01S0101 – negative bias for several metal results; no LCS run for oil samples in RIN 01S0109
	MS		75%<%R<125%	≥1/batch	non-site matrix used for RIN 01S0101, thus not representative of RFETS matrix; low bias in Hg results for soil in RIN 01S0105; MS failed for 2 sediments in RIN 01S0105
	blanks	lab	mg/kg	≥1/batch	Because no real sample results exceeded action levels, positive blank results did not affect decisions; negative bias in As, Cd, Hg for soils in 01S0105
	serial dilutions		%D<10%	≥1/batch	
	interference check std (ICP)		80%<%R<120%	bracket batch	
PRECISION	MSD		RPD<30%	≥1/batch	
	field duplicate		all results < RL	≥1/batch	None taken; however, overall repeatability within the sample set was evident based on all 5 sample results well below their respective RFCA action levels.
REPRESENTATIVENESS	COC		qualitative	NA	Chain-of-Custody intact; data packages complete; containers w/ custody seals
	hold times/preservation		≤180 days	NA	
	Controlling Documents (Plans, Procedures, Maps, etc.)		qualitative	NA	SW-846 analytical methods; original Characterization Package (planning document) for field/sampling procedures; thorough documentation of the planning, sampling/analysis process; data reporting format satisfactory – summary format (report) combined with complete data packages (on file w/ ASD)
COMPARABILITY			mg/kg	NA	Use of standardized engineering units in the reporting of measurement results;
COMPLETENESS	Plan vs. Actual samples usable results vs. unusable		>95% >95%	NA	see Table H-8
SENSITIVITY	detection limits		various	all analytes	All reporting limits were less than one order of magnitude of the associated action level.

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Table H-5 V&V of Chemical Results – Volatile Organic Compounds (VOCs)

V&V CRITERIA, CHEMICAL ANALYSES			DATA PACKAGE		
VOCs	METHOD: SW8260		LAB ---->	Severn-Trent, Denver	
			RIN ---->	various	
QUALITY REQUIREMENT					COMMENTS
			measure	frequency	
ACCURACY	calibrations	initial	±40%D in Response Factor	≥1/batch	2 analytes failed, but not significantly enough to affect detection limits
		continuing	80%<%R<120%	≥1/batch	as above
	LCS		80%<%R<120%	≥1/batch	Accuracy was adequate based on acceptable percent recoveries of LCS performed on a laboratory batching basis (spike @ x ug).
	MS		75%<%R<125%	≥1 batch	
	blanks	lab	ug/kg	≥1/batch	Because no real sample results exceeded action levels, blank results did not affect decisions
	internal standards		retention times and area factors	≥1/batch	
	surrogate		%R (variable)	≥1/batch	
PRECISION	MSD		RPD<30%	≥1/batch	
	field duplicate		all results < RL	≥1/batch	None taken; however, overall repeatability within the sample set was evident based on all 5 sample results at or near detection limits.
REPRESENTATIVENESS	COC		qualitative	NA	Chain-of-Custody intact; data packages complete; containers w/ custody seals
	hold times/preservation		≤ 14 days	NA	01S0102 – 3 water samples exceeded hold time, which results in a negative bias for the values
	Controlling Documents (Plans, Procedures, maps, etc.)		qualitative	NA	SW-846 analytical methods; original Characterization Package (planning document) for field/sampling procedures; thorough documentation of the planning, sampling/analysis process; data reporting format satisfactory – summary format (report) combined with complete data packages (on file w/ ASD)
COMPARABILITY			ug/kg	NA	Use of standardized engineering units in the reporting of measurement results;
COMPLETENESS	Plan vs. Actual samples usable results vs. unusable		>95% >95%	NA	See Table H-8
SENSITIVITY	detection limits		various	all analytes	All reporting limits were less than one order of magnitude of the associated action level. – exceptions are

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Table H-6 V&V of Chemical Results – Volatile Organic Compounds (SVOCs)

V&V CRITERIA, CHEMICAL ANALYSES			DATA PACKAGE		
SVOCs	METHOD: SW8270		LAB ---->	Severn-Trent, Denver	
			RIN ---->	various	
QUALITY REQUIREMENT					COMMENTS
			measure	frequency	
ACCURACY	calibrations	initial	±40%D in Response Factor	≥1/batch	2 analytes failed, but not significantly enough to affect detection limits
		continuing	80%<%R<120%	≥1/batch	as above
	LCS		80%<%R<120%	≥1/batch	
	MS		75%<%R<125%	≥1 batch	
	blanks	lab	ug/kg	≥1/batch	Because no real sample results exceeded action levels, blank results did not affect decisions
	internal standards		retention times and area factors	≥1/batch	
	surrogate		%R (variable)	≥1/batch	
PRECISION	MSD		RPD<30%	≥1/batch	
	field duplicate		all results < RL	≥1/batch	None taken; however, overall repeatability within the sample set was evident based on all 5 sample results at or near detection limits.
REPRESENTATIVENESS	COC		qualitative	NA	Chain-of-Custody intact; data packages complete; containers w/ custody seals
	hold times/preservation		≤ 14 days	NA	
	Controlling Documents (Plans, Procedures, maps, etc.)		qualitative	NA	SW-846 analytical methods; original Characterization Package (planning document) for field/sampling procedures; thorough documentation of the planning, sampling/analysis process; data reporting format satisfactory – summary format (report) combined with complete data packages (on file w/ ASD)
COMPARABILITY			ug/kg	NA	Use of standardized engineering units in the reporting of measurement results;
COMPLETENESS	Plan vs. Actual samples usable results vs. unusable		>95% >95%	NA	
SENSITIVITY	detection limits		various	all analytes	adequate per use of 20x rule for comparison with TCLP (characteristic) action levels

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Table H-7 V&V of Chemical Results – PCBs

V&V CRITERIA, CHEMICAL ANALYSES			DATA PACKAGE		
PCBs	METHOD: SW8280		LAB ---->	Severn-Trent, Denver	
			RIN ---->	various	
QUALITY REQUIREMENT					COMMENTS
			measure	frequency	
ACCURACY	calibrations	initial	r ² >0.99	≥1/batch	original data package filed by ASD, Bldg. 881
		continuing	80%<%R<120%	≥1/batch	as above
	LCS		80%<%R<120%	≥1/batch	Accuracy was adequate based on acceptable percent recoveries of LCS performed on a laboratory batching basis (spike @ x ug).
	MS		75%<%R<125%	≥1/batch	2 waters exceeded tolerance limits in RIN 01S0102
	blanks	lab	<MDL	≥1/batch	Because no real sample results exceeded action levels, blank results did not affect decisions
PRECISION	MSD		75%<%R<125%	≥1/batch	
	field duplicate		all results < RL	≥1/batch	None taken; however, overall repeatability within the sample set was evident based on all 5 sample results at or near detection limits.
REPRESENTATIVENESS	COC		qualitative	NA	Chain-of-Custody intact; data packages complete; containers w/ custody seals
	hold times/preservation		≤30 days extract ≤45 days analysis	NA	
	Controlling Documents (Plans, Procedures, maps, etc.)		qualitative	NA	SW-846 analytical methods; original Characterization Package (planning document) for field/sampling procedures; thorough documentation of the planning, sampling/analysis process; data reporting format satisfactory – summary format (report) combined with complete data packages (on file w/ ASD)
COMPARABILITY			ug/kg	NA	Use of standardized engineering units in the reporting of measurement results;
COMPLETENESS	Plan vs. Actual samples usable results vs. unusable		>95% >95%	NA	
SENSITIVITY	detection limits		various	all analytes	All reporting limits were less than one order of magnitude of the associated action level.

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Table H-8 Data Completeness Summary for the 883 Cluster.

ANALYTE	# Samples Planned (incl. Media; Real & QC Samples)	# Taken (Real & QC Samples)^B	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Asbestos^A <ul style="list-style-type: none"> Bldg 879 Bldg 883 	(biased/reals) 5 0	(no QC) 5 0	No ACM	40 CFR 763.86; 5 CCR 1001-10; EPA 600/R-93/116 RIN 01D1073 ("No ACM" is <1% by volume)
Beryllium (swipes) <ul style="list-style-type: none"> Bldg 879 Bldg 883 	(total, biased, reals) 26 random and biased ≥30 biased	24 real, 2 blanks 58 real	No contamination at any location Type 2 classification confirmed by contamination	OSHA ID-125G RIN 01D0816 Quantity of random vs. biased not differentiated in planning document RIN 01D1449
Metals (total) <ul style="list-style-type: none"> Bldg 879 Bldg 883 (Tank 13) Bldg 883 Clearing Press, Rm 105 "A" Press, Rm 109 "B" Press, Rm 102 "B" Mill, Rm 112 Elevator Shaft Tank 016 	(biased/reals) dependent on walkdown	(no QC) 0 1 (sediment) 1 (water) 1 (oil) 1 (oil) 1 (oil) 1 (water) 1 (oil) 1 (sediment) 1 (water)		sampling precision within sediment indeterminate RIN 01S0105 RIN 01S0102 RIN 01S0109 RIN 01S0101 RIN 01S0105 RIN 01S0102
VOCs <ul style="list-style-type: none"> Bldg 879 Bldg 883 (Tank 13) 	dependent on walkdown	0 1 (sediment) 3 (water)		sampling repeatability in water matrix acceptable based on precision between real samples; sampling precision within sediment indeterminate RIN 01S0105 RIN 01S0102

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Table H-8 Data Completeness Summary for the 883 Cluster.

ANALYTE	# Samples Planned (incl. Media; Real & QC Samples)	# Taken (Real & QC Samples)^B	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
<ul style="list-style-type: none"> Bldg 883 Clearing Press, Rm 105 "A" Press, Rm 109 "B" Press, Rm 102 "B" Mill, Rm 112 Tank 016 		1 (oil) 1 (oil) 1 (oil) 3 (water) 1 (sediment) 3 (water)		RIN 01S0109 RIN 01S0109 RIN 01S0102
SVOCs <ul style="list-style-type: none"> Bldg 879 Bldg 883 (Tank 13) Bldg 883 Clearing Press, Rm 105 "A" Press, Rm 109 "B" Press, Rm 102 "B" Mill, Rm 112 Tank 016 	dependent on walkdown dependent on walkdown	0 1 (sediment) 3 (water) 1 (oil) 1 (oil) 1 (oil) 3 (water) 1 (sediment) 3 (water)		RIN 01S0105 RIN 01S0102 sampling repeatability in water matrix acceptable based on precision between real samples; sampling precision within sediment indeterminate RIN 01S0109 RIN 01S0105 RIN 01S0102

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Table H-8 Data Completeness Summary for the 883 Cluster.

ANALYTE	# Samples Planned (incl. Media; Real & QC Samples)	# Taken (Real & QC Samples) ^B	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
PCBs				
• Bldg 879	dependent on walkdown	0		
• Bldg 883 (Tank 13)	dependent on walkdown	1 (sediment) 1 (water) 2 (water)		RIN 01S0105 as above RIN 01S0102 sampling repeatability in water matrix acceptable based on precision between real samples; sampling precision within sediment indeterminate
• Bldg 883 Clearing Press, Rm 105		1 (oil)		RIN 01S0109 this sample exceeded its associated action level
• "A" Press, Rm 109		1 (oil)		29 ppm detected
• "B" Press, Rm 102		1 (oil)		9.1 ppm detected
• "B" Mill, Rm 112		2 (water)		
• Elevator Shaft		1 (oil)		RIN 01S0101
• Tank 016		1 (sediment) 2 (water)		RIN 01S0105 RIN 01S0102
Radiological Survey – Building 879 Interior surfaces & equipment		same	Type 2 Classification inferred	Type 2 Classification inferred because facility is Plenum Auxiliary building and process knowledge indicates high potential for contamination.
• Survey Area D	floors & walls <2m 30 α,β TSA & 30 α,β Smears (uniformly distributed) additional biased @ RCT discretion	same		
	walls & ceilings >2m 10 α,β TSA & 10 α,β Smears (biased) additional biased @ RCT discretion	same		
	Equipment			

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Table H-8 Data Completeness Summary for the 883 Cluster.

ANALYTE	# Samples Planned (incl. Media; Real & QC Samples)	# Taken (Real & QC Samples)^B	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
	30 TSA & 30 Smears (15 random + 2 biased) ≥5% QC TSA 10% Scan Biased Scans			
<ul style="list-style-type: none"> Survey Area F 	alpha & beta surveys floors & walls <2m 30 α,β TSA & 30 α,β Smears (uniformly distributed) additional biased @ RCT discretion	same	Type 2 Classification inferred	
Building 883 <ul style="list-style-type: none"> Survey Unit/Area 883001 	15 TSA & 15 Smears (random) ≥5% QC TSA ≥5% Scan	same	No contamination at any location; all values below unrestricted release levels	No results above DCGL _W or DCGL _{EMC} action level (20 dpm/100cm ² removable, 100 dpm/100cm ² average, and 300 dpm/100cm ² maximum.
<ul style="list-style-type: none"> Survey Unit/Area 883002 	15 TSA & 15 Smears (random) ≥5% QC TSA ≥5% Scan	same		
<ul style="list-style-type: none"> Survey Unit/Area 883003 	15 TSA & 15 Smears (random) ≥5% QC TSA ≥5% Scan	same		
<ul style="list-style-type: none"> Survey Unit/Area 883004 	15 TSA & 15 Smears (random) ≥5% QC TSA ≥5% Scan	same		
<ul style="list-style-type: none"> Survey Unit/Area 883005 	15 TSA & 15 Smears (random) ≥5% QC TSA ≥5% Scan	same		
<ul style="list-style-type: none"> Survey Unit/Area 883006 	15 TSA & 15 Smears (random) ≥5% QC TSA	same		

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182

Table H-8 Data Completeness Summary for the 883 Cluster.

ANALYTE	# Samples Planned (incl. Media; Real & QC Samples)	# Taken (Real & QC Samples)^B	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
<ul style="list-style-type: none"> Survey Unit/Area 883007 Survey Unit/Area 883008 Survey Unit/Area 883009 	<p>≥5% Scan</p> <p>21 TSA & 21 Smears (random) ≥5% QC TSA ≥5% Scan</p> <p>20 TSA & 20 Smears (random) ≥5% QC TSA ≥5% Scan</p> <p>19 TSA & 19 Smears (random) ≥5% QC TSA ≥5% Scan</p>			Derivation of final TSA values ambiguous, per cpm to dpm conversions and 24 – 48 decay times.







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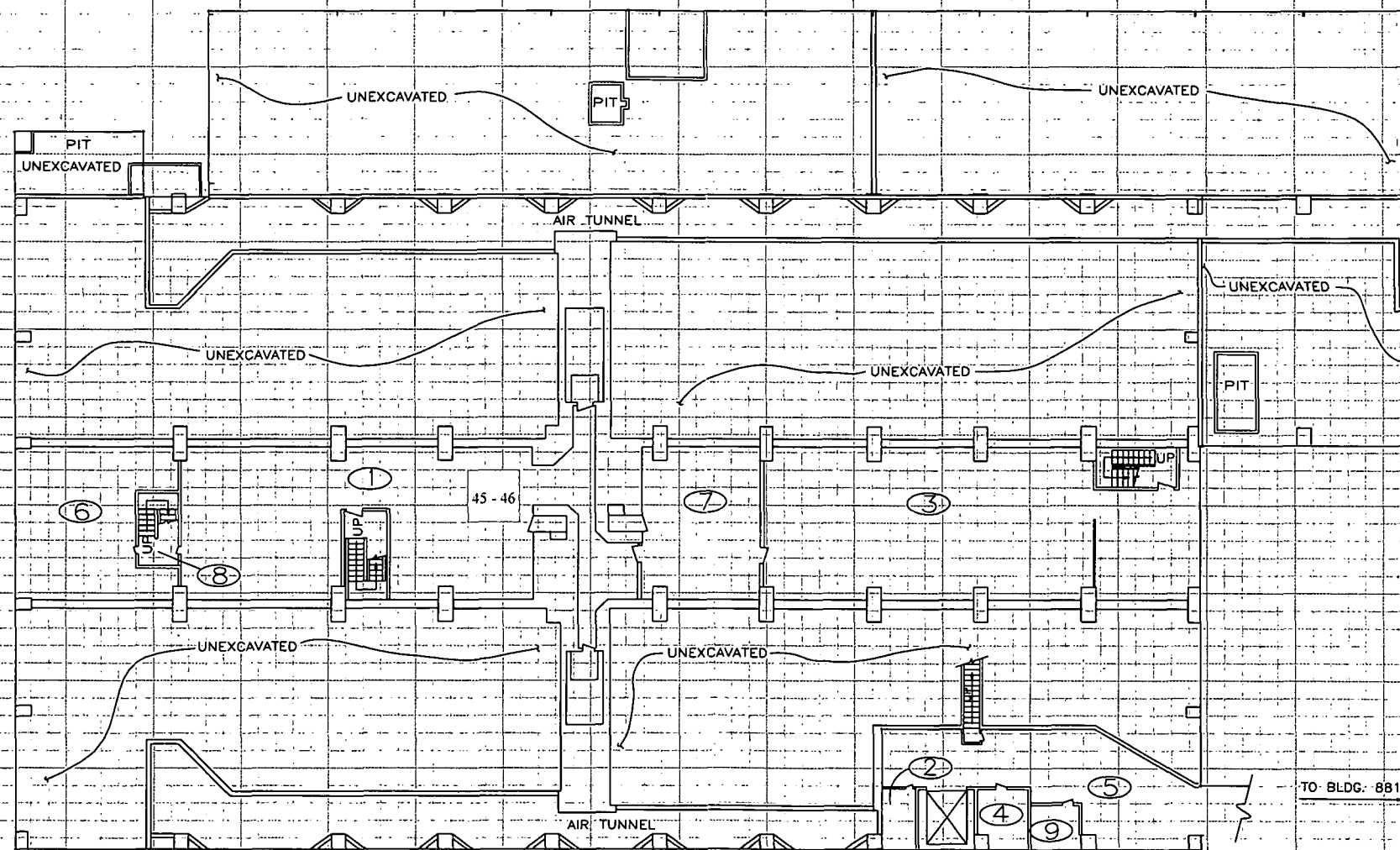
~~180/180~~

PRE-DEMOLITION SURVEY

Survey Area: F Survey Unit: N/A Classification: N/A
Building: 883
Survey Unit Description: Sumps, Pits, Trench & Scale
Total Area: N/A sq. m. Total Floor Area: <1000 sq. m.

SURVEY SURFACE TYPES

-  Scale
-  Press
-  Floor Area
-  N&S Tanks
-  Sump Location
-  Elevator Location

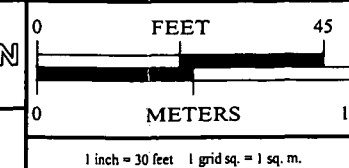


BLDG. 883 TUNNELS FLOOR PLAN

SURVEY MAP LEGEND

1 - 65 Smear & TSA Location

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MAP ID: 62002/02-0012/B883 Base October 8, 2001







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89

PRE-DEMOLITION SURVEY

Survey Area: F Survey Unit: N/A Classification: N/A
 Building: 883
 Survey Unit Description: Sumps, Pits, Trench & Scale
 Total Area: N/A sq. m. Total Floor Area: <1000 sq. m.

SURVEY SURFACE TYPES

-  Scale
-  Press
-  Floor Area
-  N&S Tanks
-  Sump Location
-  Elevator Location

BLDG-883 FIRST FLOOR PLAN

SURVEY MAP LEGEND

1 - 65 Smear & TSA Location

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← N

FEET

45

METERS

15

1 inch = 30 feet 1 grid sq. = 1 sq. m.

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MAP ID: FV2002/02-0012/B883_1

October 8, 2001

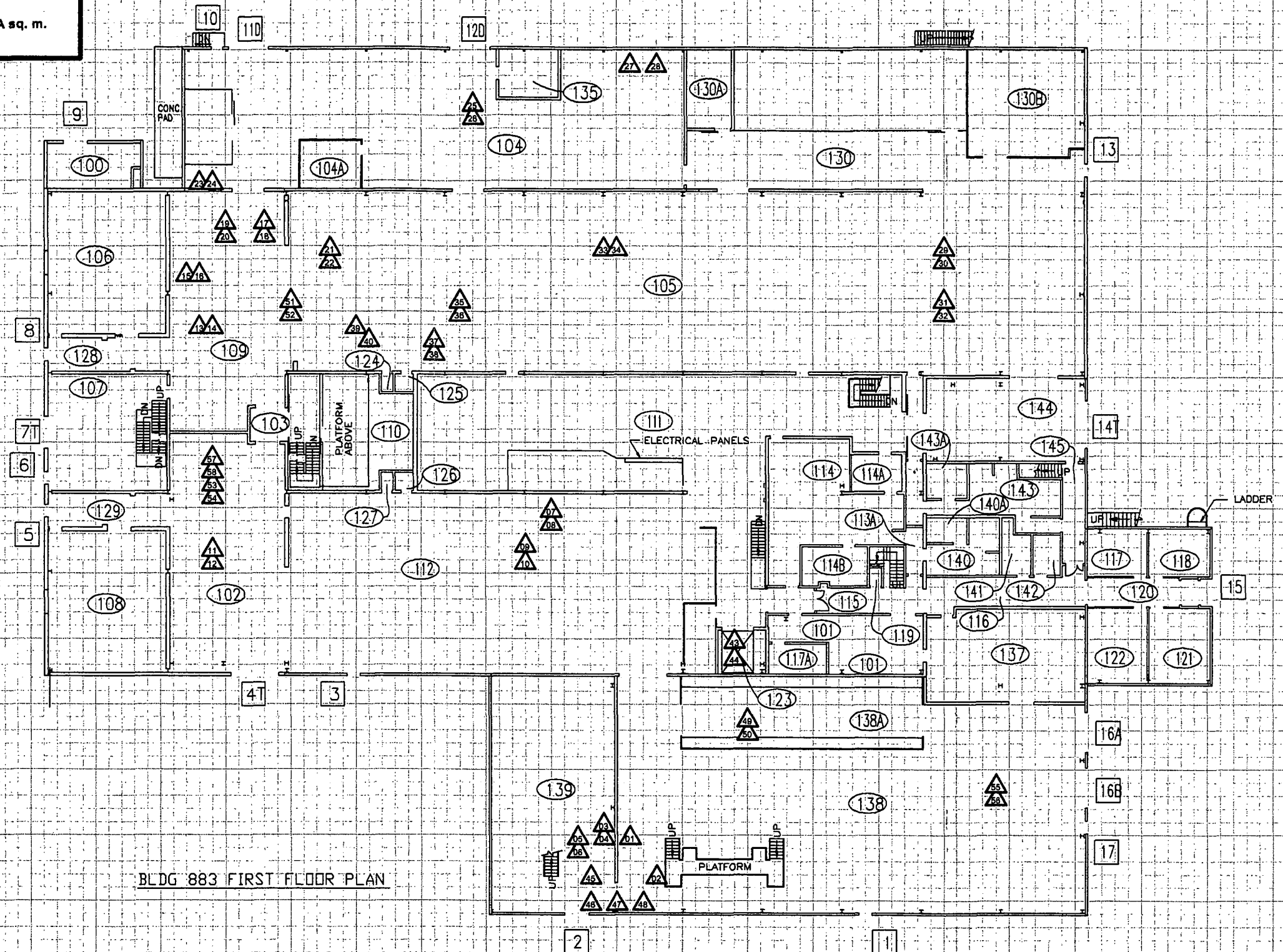
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RLC SURVEY FOR 883 CLUSTER

Survey Area: N/A Survey Unit: N/A Classification: N/A
 Building: 883
 Survey Unit Description: N/A
 Total Area: N/A sq. m. Total Floor Area: N/A sq. m.



BLDG 883 FIRST FLOOR PLAN

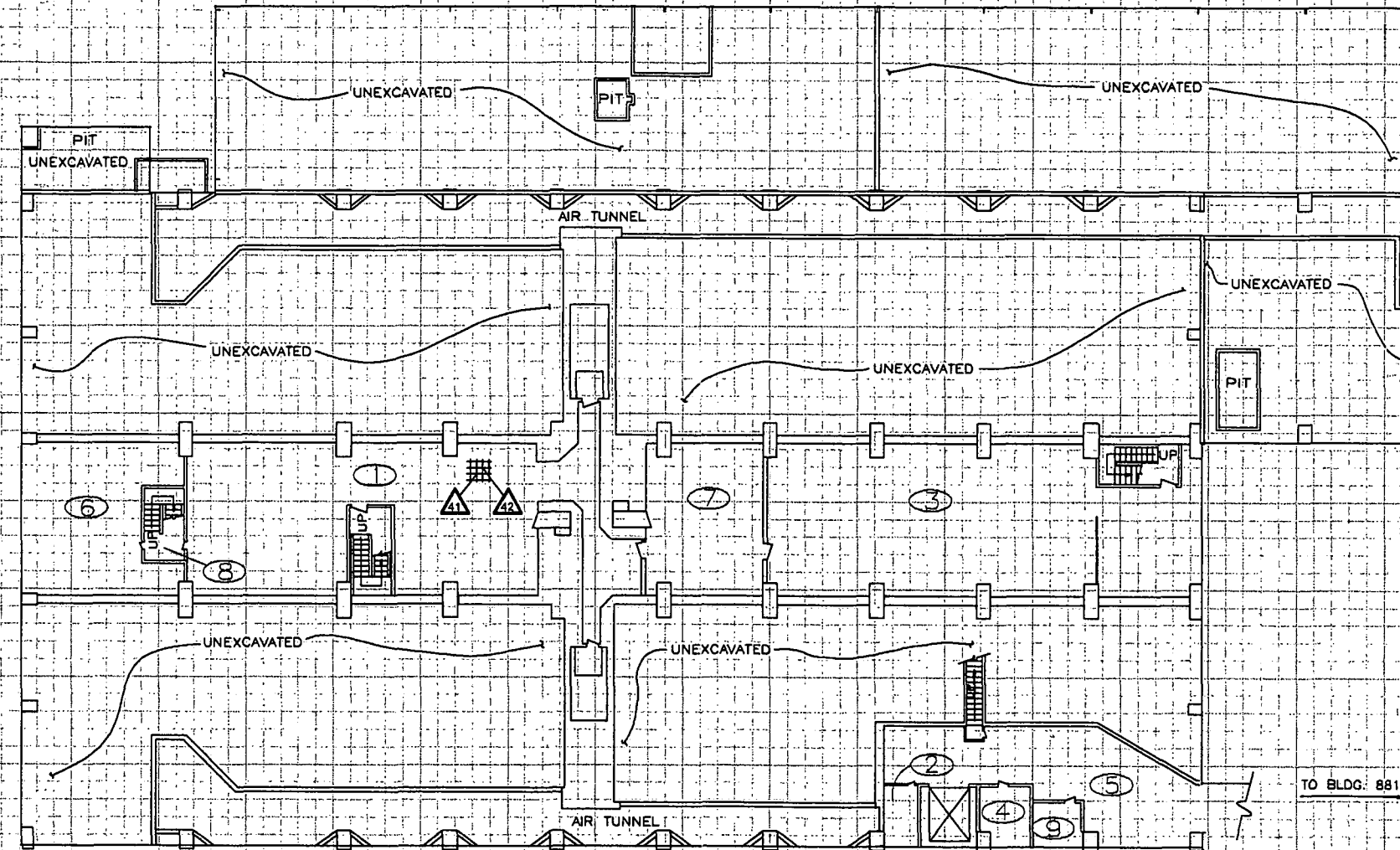
SURVEY MAP LEGEND <ul style="list-style-type: none"> Asbestos Sample Location Beryllium Sample Location Lead Sample Location RCRA/CERCLA Sample Location PCB Sample Location 	<p>Neither the United States Government nor Kaiser 188 Co., nor DynCorp 188T, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.</p>	<p>0 45 FEET</p> <p>0 15 METERS</p> <p>1 inch = 30 feet 1 grid sq. = 1 sq. m.</p>	<p>U.S. Department of Energy Rocky Flats Environmental Technology Site</p> <p>Prepared by: GHS Dept. 203-068-7707</p> <p>DynCorp THE ART OF TECHNOLOGY</p> <p>MAP ID: fy2002/02-0020/8883-18</p> <p>October 9, 2001</p>
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161

RLC SURVEY FOR 883 CLUSTER

Survey Area: N/A Survey Unit: N/A Classification: N/A
 Building: 883
 Survey Unit Description: N/A
 Total Area: N/A sq. m. Total Floor Area: N/A sq. m.



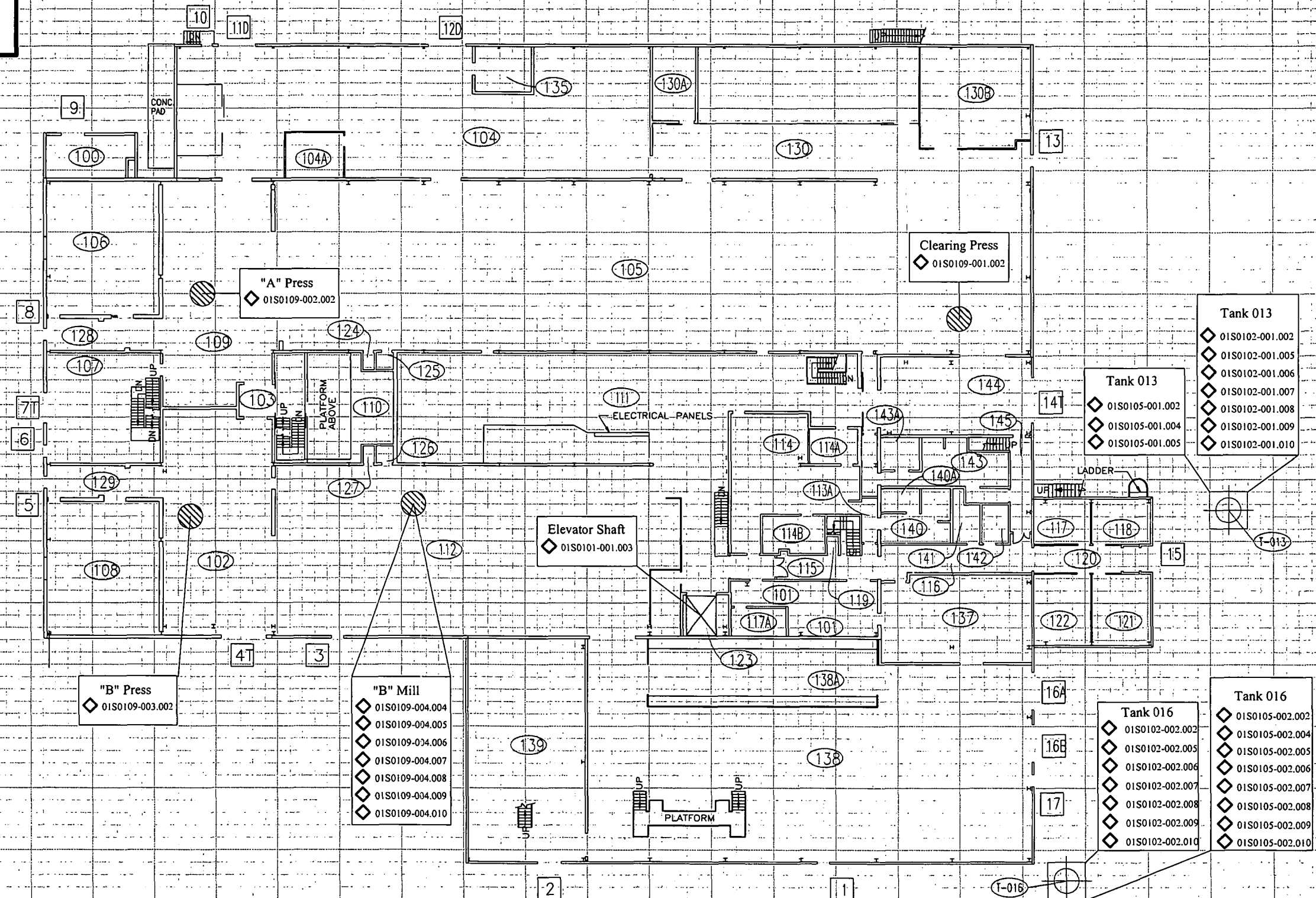
BLDG 883 TUNNELS FLOOR PLAN

SURVEY MAP LEGEND <ul style="list-style-type: none"> Asbestos Sample Location Beryllium Sample Location Lead Sample Location RCRA/CERCLA Sample Location PCB Sample Location 	<p>Neither the United States Government nor Kaiser I&E Co., nor DynCorp I&E, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.</p>	<p>0 45 FEET</p> <p>0 15 METERS</p> <p>1 inch = 30 feet 1 grid sq. = 1 sq. m.</p>	<p>U.S. Department of Energy Rocky Flats Environmental Technology Site</p> <p>Prepared by: OHS Dept. 303-966-7707</p> <p>DynCorp THE ART OF TECHNOLOGY</p> <p>MAP ID: IV2002/02-0020/B883-Tun-Be October 10, 2001</p> <p>PAGE 1 OF 1</p>
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CHEMICAL SAMPLE MAP FOR 883 CLUSTER

Building: 883
First Floor

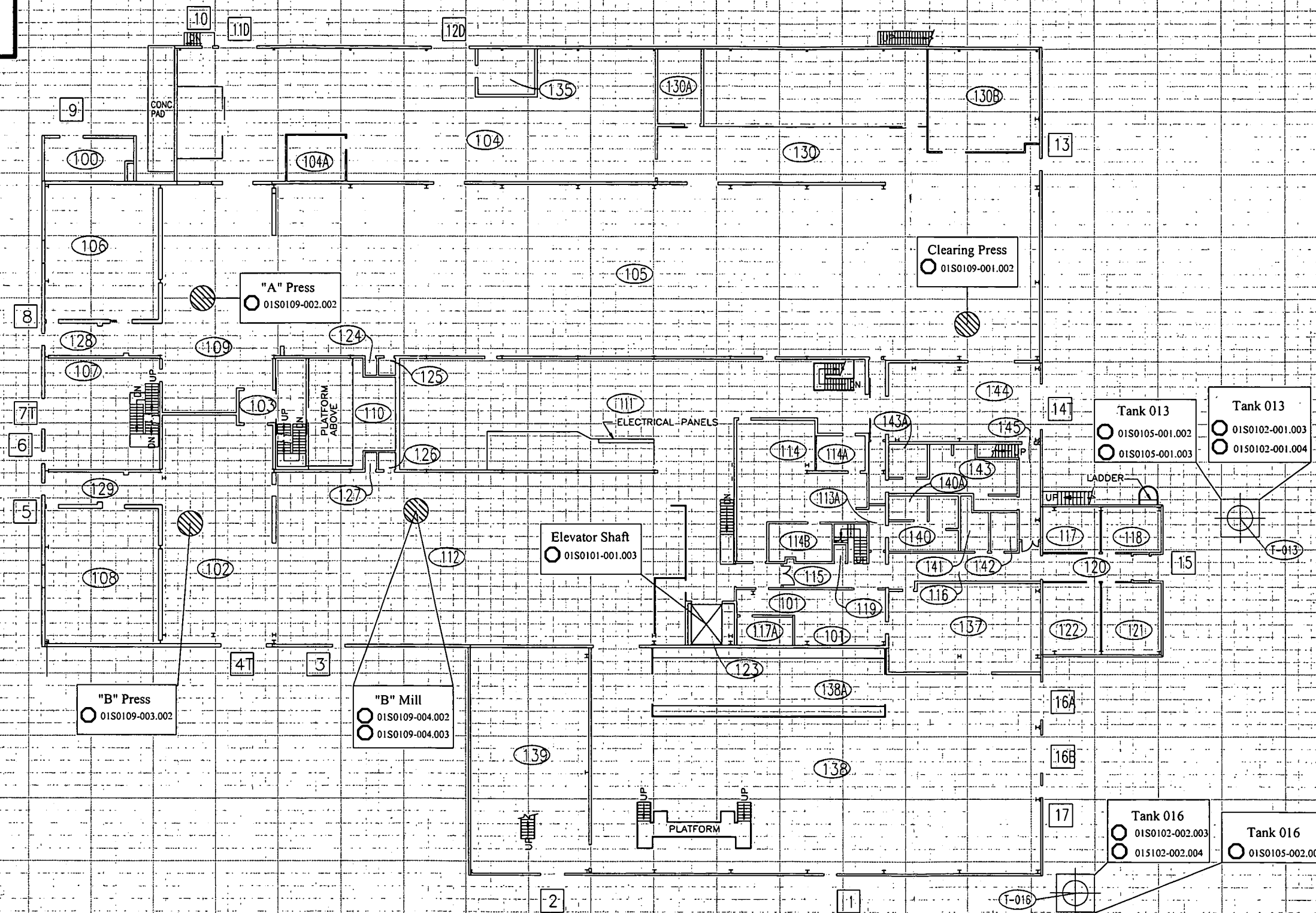


<p>SURVEY MAP LEGEND</p> <ul style="list-style-type: none"> Asbestos Sample Location Beryllium Sample Location Lead Sample Location RCRA/CERCLA Sample Location PCB Sample Location Open/Inaccessible Area Area in Another Survey Unit 	<p>Neither the United States Government nor Kaiser Hill Co., nor DynCorp LLC, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.</p>	<p>0 45 FEET</p> <p>0 15 METERS</p> <p>1 inch = 30 feet 1 grid sq. = 1 sq. m.</p>	<p>U.S. Department of Energy Rocky Flats Environmental Technology Site</p> <p>Prepared by: GIS Dept. 303-968-7707</p> <p>DynCorp THE ART OF TECHNOLOGY</p> <p>MAP ID: tv2001/02-0028/B883 October 10, 2001</p>
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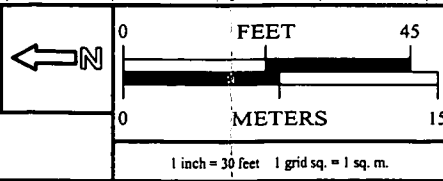
CHEMICAL SAMPLE MAP FOR 883 CLUSTER

Building: 883
First Floor



- SURVEY MAP LEGEND**
- Asbestos Sample Location
 - Beryllium Sample Location
 - Lead Sample Location
 - RCRA/CERCLA Sample Location
 - PCB Sample Location
 - Open/Inaccessible Area
 - Area in Another Survey Unit

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